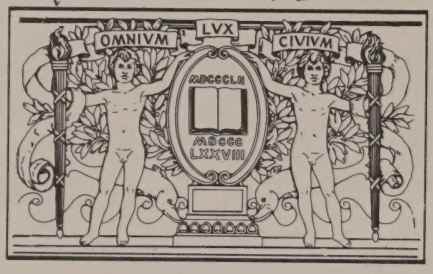
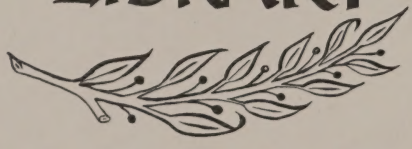
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VOL VII JULY-SEPTEMBER, 1897. No. 1.

THE VILLAS OF ROME.

PART II.

THE gardens of Italy have for centuries excited the admiration of the world and have served as the models of all that has since been done in landscape gardening on classic lines. As early as 1492, when the French made their memorable invasion of Italy so fruitful in the discovery of Italian civilization, if of nothing else, Charles VIII. writes: "Above all you would not believe what fine gardens I have in this city, for on my faith it seemeth that they lack only Adam and Eve to make them a veritable Paradise on earth."

Since then these villas have been described and studied, measured and drawn by many eminent architects. Of these the earliest, such as Falda and Piranesi, contented themselves with descriptions and drawings of the picturesque qualities of the villas, and it was not until Percier and Fontaine had spent many years of patient labor in drawing from measurement the casinos and their gardens that anything in the way of careful research and scientific accuracy was attempted. Even in their day many of the notable villas, such as the Madama, Negroni and Sacchetti were already in ruins, while since then the iconoclastic builders of modern Rome have spared only such as were beyond their reach.

In a previous number (Architectural Record, Vol. VI., No. III.) the villas of the city proper were described. As was there pointed out, there is a marked difference in character between the urban and suburban villas. In the former, the buildings were intended as rendezvous rather than as residences, and were seldom more than casinos, intended for the exhibition of works of art. The grounds are for the most part too restricted to permit of any extended treatment in the ramps and terraces, which give to the gardens their chief at-

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traction, while the water, which plays such an important part in Italian landscape gardening, could only be obtained from a distance, and the expense limited its use to fountains. None of these restrictions was imposed upon the architect of the suburban villa. The casinos expand themselves into huge buildings capable of accommodating a large company and their retinue, while the parks and gardens which occupy a large area, are treated with the greatest skill.

Before we proceed to describe the villas in detail it will be well to consider the social conditions of which they are the expression, the sources from which their characteristic details were derived, and in studying them as a whole to discover, if possible, what constitutes their peculiar charm.

In the first place we must remember that an Italian villa is not a single building, but rather a great establishment, consisting of the casino, or dwelling of the proprietor, the secondary buildings, such as farmhouses, out-buildings and dependencies, and the park, with its gardens, terraces, fountains and pavilions. It is the park rather than the casino which is remarkable, for the latter is seldom of any great architectural interest, and is considered, not as with us the most important part of a suburban residence, but only as a refuge in inclement weather, or as a shelter at night.

In considering Italian villas one is at once struck by the judgment with which the site has been selected, the ingenuity with which every natural advantage of the place has been made use of, and the skill with which the architect has so disposed the various parts that all may form a charming whole, while on every side may be new surprises and unexpected delights.

The buildings are never placed as with us almost at random, but there is always a progression artistically managed from the unconfined naturalism of the lower park to the strict formalism of the grounds which immediately surround the casino. In the Italian gardens there is all the variety and picturesqueness of other parks, without either the puerile simplicity or monotony which too often characterizes our efforts. With them there is never the small ingenuity or the ingenuity in small things—the petty details that confuse our scheme are properly subordinated. Things are done with a more liberal hand. The statues, vases and fountains are of real bronze or marble, not base imitations in iron or zinc; the porticos, casino and summer houses are of carved stone, and never of painted wood or rustic work. The architectural features, such as fountains, pavilions and statues, are placed to the best advantage and appear to have been called into existence by the necessity of the site, rather than as if, procured by accident, they have found a resting place almost by chance in this place rather than in another.



CHATEAU D'EAU OF THE VILLA TORLONIA, FRASCATI.



A BASIN AT THE VILLA TORLONIA, FRASCATI.

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Many of the features, such as the colossal statues, the Nile gods, grottos encrusted with seashells or covered with stalactites carved in stone, seem strange to us, but these details are seldom capriciously bizarre; they are always controlled by a fixed purpose and are introduced to produce a certain effect. The faults committed are seldom those of the ignorance which places ingenuity above sentiment or mistakes silliness for simplicity. Statues of iron and fountains of zinc are not mistaken for magnificence.

It would be strange if it were otherwise. The Roman aristocracy were wealthy and prided themselves on their patronage of the arts. Ready to their hands was the most skilful band of artists and artisans that the modern world has seen. The very soil was rich in the



WALK SHADED BY YEW TREES, FLORENCE.

buried treasures of ancient art, the spoils of every country, which for centuries had been awaiting an appreciative age.

The villas became museums of ancient art, and the grounds were filled with originals or replicas of the best that Greek art had produced—columns, statues, vases and marbles, discovered for the most part on the very spot. This rich heritage of ancient Rome the master minds of the Renaissance made intelligent use of, placing it where it would appear to the best advantage.

The skilful disposition of these details and the wonderful skill with which the varied effects are obtained from the use of water in cascades, fountains, grottos and nymphaea seem like fairyland or the



RESTORATION OF THE VILLA MADAMA. By M. Benard.

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gardens of Armida, or pursuade us the brilliant conceptions of Ariosto have been realized. At every step new beauties are discovered, from every terrace the wonderful panorama of the Campagna spread at our feet claims attention, while around us at every turn open new vistas. Here a fountain throws its water to a great height against a background of dark foliage; there a stream issues from an obscure grotto formed by mossy rocks, or pours from the throat of some great Triton to form a pool, in which are reflected the foliage of the overhanging trees; then descending through stone channels with a thousand mimic cascades, the stream enters a more formal basin, whose clear waters reflect the marble balustrades and show the mosaic pattern of its bottom, and as we follow its descent through a succession of cascades, rivulets and basins, the scene becomes ever more formal until the casino itself is reached.

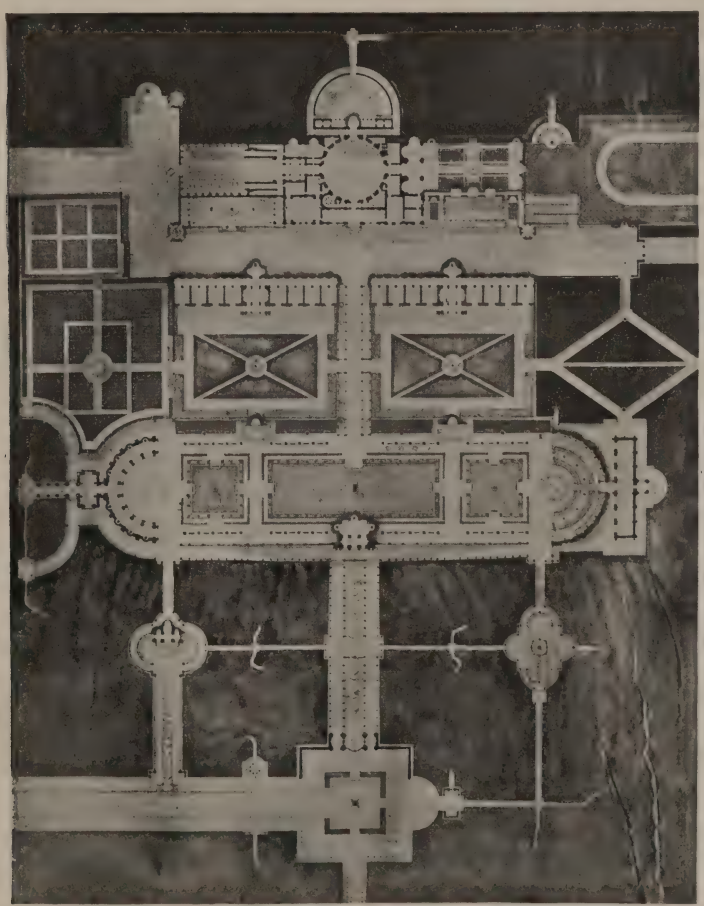
This is usually placed on a great terrace. Behind it is often a gallery or amphitheatre of formal design wherein niches, statues and fountains are disposed. Above this, on the wooded hillside, is placed the chateau d'eaux, which occupies a wide passage cut through the forest trees.

The waters are led under the casino and issue again in a similar succession of delightful features until the lowest terrace is reached. This is laid out as a pasture, with beds of flowers within hedges of box, and adorned with statues and fountains. While the parterre, the ramps and terraces which lie before the casino, are usually bathed in the bright Italian sunlight, those at the rear are more naturalistic and picturesque, and are shrouded in the shadows cast by the great trees. Throughout the park paths symmetrically disposed radiate from pavilions or porticos. Here a marble casino, half covered with Roman roses, invites repose and offers an extended view across the Campagna. Further on a grotto, ornamented with shells and wet with dripping plants, enshrines the image of a wood nymph; again, a more pretentious structure with walls of marble and a stuccoed ceiling, decorated in arabesque, contains some rarer statue. Architecture, painting and sculpture, created by the same mind and often executed by the same hand, are united in perfect harmony.

Though seldom occupied, these villas still preserve an appearance of grandeur and magnificence, which the desertion of their owners has in no way detracted from, while the abandon, if anything, lends a greater charm. The effect is not that of disorder, nor does it suggest the picture of ruin and desolation that might be expected. These gardens give us an exact idea of the famous villas of ancient Rome, of the much praised gardens of Lucullus and Sallust, or the villas of Cicero and Pliny.

It is, indeed, remarkable how many of these features the architects of the Renaissance derived directly from their ancestors, the ancient

Romans, whose passion for villa building is evinced by the ruins of the numerous villas, which once filled the Campagna and made of this now deserted plain a garden, which reached from the walls of Rome to the Alban hills. These villas were built on much the same plan, rising in terraces against the side of a hill, each terrace supported upon huge arched foundation walls, which, on a lower terrace, were ornamented with niches and grottos. The lower grounds were never



PLAN OF THE VILLA MADAMA.

Restored by M. Benard.

occupied by buildings, but were laid out in gardens, pastures and vineyards. On the very summit of the hill was placed the dwelling of the proprietor. By this arrangement a view could be obtained from every terrace, and a comparatively small supply of water could be used over and over again in the decoration of the grounds.

The most striking characteristic of these gardens was the entire absence of natural beauty. No tree or shrub was allowed to grow in its own fashion, but all were made to conform to the will of the head

gardener, or topidarius, who was ever present to lend a correcting hand, and force the wilful foliage into the prescribed form.

The allées were shut in by hedges of box and rosemary, which were carefully trimmed into walls by the skilful hand of the topidarius. False as this taste may be we must remember that the gardens of the Romans contained but few plants, and these by no means very interesting ones. Foreign countries had not as yet been made to contribute a thousand kinds of trees and flowers; those at the command of the Romans—the box, myrtle, yew, plane, ilex and laurel—are alike in character, and the desire of imparting interest to their foliage led the Ancients into all manner of absurdities. Paths were often covered with trellises and green arbors, made by stretching canes



THE LOGGIA OF THE VILLA MADAMA.

from stucco columns over which were trained grape vines, as is the custom in Italy to-day. Violets and roses were the favorite flowers, but the gardens also contained the crocus, narcissus, lilies, hyacinth, poppy and amarynth.

To obtain a perfect picture of the suburban villa of the Renaissance one has only to read the description by Pliny of his Laurentine villa (Pliny, Lib. II., Ep. XVII.).

How large must have been the great villas of the Roman Emperors we may imagine from reading the description of this villa which Pliny says is "large enough to afford all desirable accommodations without being extensive."

Forty-six rooms are described, and yet that half of the house



DECORATION IN PLASTER ON THE VAULTING OF THE VILLA MADAMA.

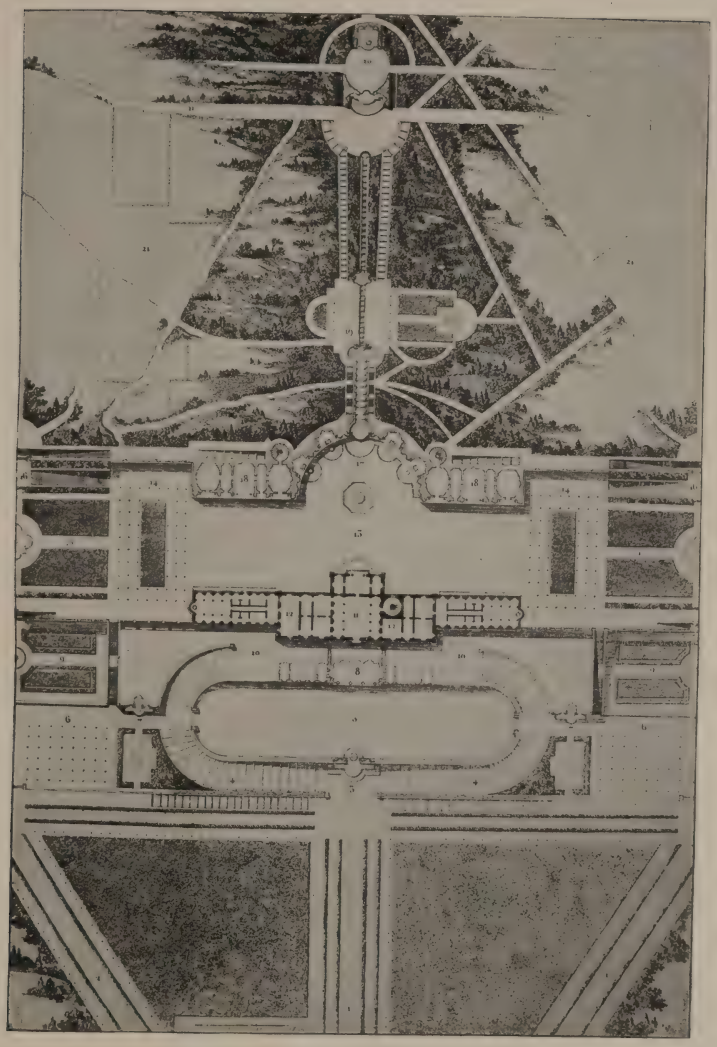
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which was allotted to the slaves is passed over with a mere mention. There were rooms adapted for every kind of weather, according as they were sheltered or exposed to the different winds or received the morning or afternoon sun.

But it was on the gardens of the villas that the Romans lavished their greatest care. Their lives were for the most part spent out of doors, in the exercises of the gestatio or the tennis court, in walking in the shaded allées or in the porticos and galleries which surrounded the house on every side. For them the house was a refuge in bad weather or during the hours of eating and sleeping; the rest of the day was spent in the open air. So it is that while the buildings were large and adorned with every art that the most luxurious could demand (for the Romans carried their taste for marbles and mosaics and furniture of bronze or carved marble, with them into the country), the buildings were insignificant when compared with the vast areas, which were laid out in terraces, gardens, race courses and swimming pools, among which was scattered a profusion of statues, of marble temples, and orange trees in vases of bronze or marble. The whole was disposed on strictly architectural lines. At the end of each alley a decorative feature closed the vista. Before the villa on successsive terraces were sheets of water in marble basins, fed by many fountains, while on either side the box-hedged allées led to the gardens and meadows below. Here and there were disposed to the best advantage porticos, libraries, dining halls and guest chambers, each occupying its own building, and removed from the noise and interruptions of the main hall.

As for the gardens, they are best described by Pliny, who writes as follows about a larger estate which he possessed among the Tuscan hills:

The exposition of the house is due south and seems to invite the afternoon sun in summer into a spacious and well proportioned portico. * * * In the front of the portico is a sort of terrace, embellished with various figures and bounded by a hedge of box, from thence you descend by an easy slope adorned with representations of various animals in box, answering alternately to each other, into a lawn overspread with the soft, I had almost said the liquid, acanthus; this is surrounded by a walk, enclosed with evergreens, shaped into a variety of forms. Beyond this is the gestatio, laid out in the form of a circus, ornamented in the middle with box cut in numberless different figures, together with a plantation of shrubs, prevented by the shears from sprouting up too high. The whole is fenced in with a wall of box rising by different ranges to the top. * * * Opposite to the centre of the portico stands a square edifice, which encompasses a small area, shaded by four plane trees, in the middle of which rises a fountain, from whence the water running over the edges of a marble basin gently refreshes the surrounding plane trees and the verdure beneath. This apartment consists of a bed chamber, secured from every kind of noise, and which the light itself cannot penetrate, and a dining room, which I use when I have only intimate friends with me. There is also another room, which, being situated close to the plane



PLAN OF THE VILLA ALDOBRANDINI.
Drawn by Percier & Fontaine.

tree, enjoys a constant shade and verdure. Its sides are encrusted half way with carved marble, and from thence to the ceiling a foliage is painted with birds intermixed among the branches, which has an effect altogether as agreeable as the marble. At the base, a little fountain playing through several small pipes into a basin produces a most pleasing murmur.

Pliny then describes a succession of apartments, dressing and annointing rooms, hot and cold baths, swimming pools and plunges, then come porticos and galleries, some of which are enclosed, bedrooms and suites of apartments, until "a very spacious hippodrome is reached."

This is enclosed on every side with plane-trees, covered with ivy, so that while their heads flourish with their own foliage, their bodies enjoy a bor-

rowed verdure and thus the ivy twining around the trunks and branches spreads from tree to tree and connects them together. Between each plane tree are planted ilexes, and behind these bay trees which blend their shade with those of the planes. * * * In one place you have a little meadow, in another the box is cut into a thousand different forms, sometimes into letters expressing the name of the master, sometimes that of the artificer, while here and there little obelisks rise intermixed with fruit trees, when on a sudden in the midst of this elegant regularity you are surprised with an elegant imitation of the beauties of rural nature. * * * At the upper end is an alcove of white marble, shaded with vines supported by four small Carystian pillars. From this bench the water, gushing through several little pipes as if it were pressed out by the weight of the persons who repose themselves upon it, falls into a stone cistern beneath, from whence it is received into a finely polished marble basin, so artfully contrived that it is always full without ever overflowing. When I sup there this basin serves as a table, the larger sort of dishes being disposed around the edge while the smaller swim about in the form of vessels or little water fowl. Corresponding to this is a fountain, which is incessantly emptying and filling, for the water, which it throws up to a great height, falling back into it, is by means of the openings returned as fast as it is received.

Then Pliny describes a "summer house of exquisite marble," then a "little private recess, furnished with a couch," and shaded by a vine; "in this place, also, is a fountain which rises and instantly disappears." Scattered throughout the grounds are "marble seats, which serve no less than the summer houses as resting places after one is tired with walking. Near each seat is a little fountain, and throughout the whole hippodrome several small rills run murmuring along wheresover the hand of art thought proper to conduct them, watering here and there different spots of verdure and in their progress refreshing the whole."

So much of Pliny's enthusiastic account of his Tuscan villa has been quoted because no better description of the villas of the Renaissance could be framed. As one charming feature after another is described we might imagine it a letter of an appreciative tourist who was attempting to give some idea of the beauties of the great villas of Frascati, Tivoli or Viterbo.

The Romans of the Renaissance were the true descendants of the Romans of old, and partly because similar modes of living required similar expression, partly because ancient culture was the fashion and men prided themselves on the accuracy with which they followed classic customs and encouraged classic art, villa building came again into fashion, and all descriptions of the ancient suburbanum were eagerly studied. Be this as it may, at the end of the fifteenth century the great Roman families began to establish for themselves the summer residences among the Alban hills which have made the landscape gardening of Italy a model to all the world.

In passing from a description of the villas contained either within



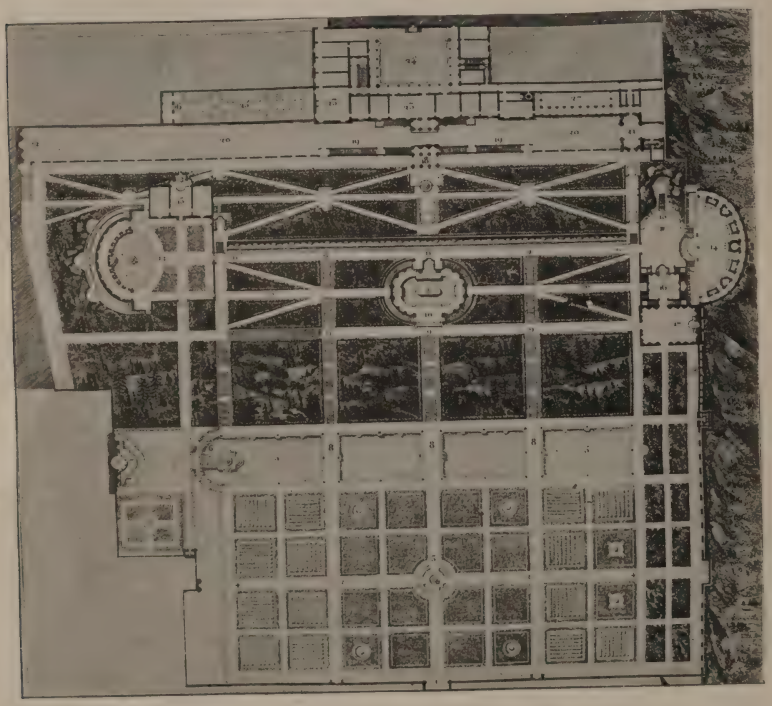
GALLERY BEHIND THE VILLA LANCELLOTTI, FRASCATI.



GALLERY OF THE VILLA MONDRAGONE, CASTELLI, ROMANI.

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in relief and in fresco. The latter have well-nigh disappeared from the walls, and can only be traced here and there by patches of color and by the indented lines, which still suggest the outlines of arabesques, garlands and cupids. The decorations in plaster for which the loggia is justly celebrated were suggested to Raphael by the beautiful decorations in relief which still exist in many of the Roman ruins. This medium he had used with great effect in the Vatican stanzas, and his pupils, Guilio Romano and Giovanni da Udine, who had taken part in the execution, naturally employed the same material in the decoration of this new work which they had inherited from their master and carried it to a still greater development.



PLAN OF THE VILLA D' ESTE.
As measured by Percier & Fontaine.

By the courtesy of the Duc de San Martino I was permitted to make careful measurements and to draw to a scale the entire loggia and many of the charming details. The delicacy of the reliefs is surprising. The pilasters and piers are completely covered with a fine network of ornament, which for the most part is not over a sixteenth of an inch in relief; those portions in high relief vary from one-half to three-quarters of an inch, the reliefs increasing in boldness as the distance from the eye becomes greater.

Added to the arabesques, which were suggested by ancient plas-



THE VILLA D' ESTE, TIVOLI.

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ter work, are many more natural motives, such as heads of wheat, strawberry leaves, flowers and birds. These appear to have been cast in moulds and affixed to the walls; the connecting lines were then made in the fresh material with some blunt instrument. In no place is there the same grouping. One pilaster is completely covered with ears of wheat, all of which are made from a single mould, but which are so skilfully disposed, and so admirably grouped by the connecting lines that some appear stiff and upright, while others droop in many different curves. The whole has all the charm of a freehand sketch. Another is covered with a fine network of strawberry leaves, also the impression of a single mould, interspersed by images of birds, disposed in such different positions that it is hard to believe that they are all from the same mould.

The vaulting of the apses is decorated in a much higher relief, representing scenes from classical mythology. Here are depicted Pan playing on his pipes, Bacchus, Atlas, Europa, Ganymede and a host of other pagan heroes and demigods. All are admirably executed, for they were modelled by the masters themselves, who did not consider it beneath their dignity to execute details which in these days would be intrusted to the workmen. Like the villa, the gardens were never more than the suggestion of the elaborate scheme which had been contemplated.

The upper terrace on which the loggia gives has been neglected for many years. In a niche, half concealed behind a tangle of fern, an elephant's head discharges a stream into the basin beneath. A stone piscina occupies the centre of the terrace, but the bowl in which the gold fish once disported is now filled with a rank growth of weeds. Below is a great basin, which once reflected the niches and grottos in the foundation walls, but the walls have lost their marble coverings and the basin that once mirrored the shrines of pagan deities now reflects only crumbling walls and tangled underbrush. The Villa Madama has more than once been restored by architects, and has received great attention from the pensioners of the French Academy at Rome. The restorations of M. Bénard which are here presented, while perhaps visionary, give an excellent idea of the scale and arrangement of a great Italian villa, and show, perhaps more clearly than any photograph of an existing villa, the treatment of ramps and terraces and the disposition of exedras, porticos, fountains and nymphaea.

If modern Rome differs from the ancient city in one respect more than another it is in the abruptness with which the city ends and the country begins.

The modern city has no suburbs, and the walls once passed one enters at once into the deserted region of the Campagna. In the time of Augustus it was impossible to define even approximately the con-



CASCADE IN THE VILLA D' ESTE, TIVOLI.



SWIMMING POOL IN THE VILLA D' ESTE.

fines of the city. To the densely populated centre succeeded a circle of detached dwellings; around these were establishments of greater pretentions, while these in turn gave place to the great villas and *latifundia*, each of which constituted a flourishing village, for Rome in those days extended to Ostia, Tusculum and Veii.

All these have now passed away, and over the buried villages and deserted grounds stretches the great plain of the Campagna.

I know of no more impressive sight than this fever-stricken wilderness whose silence is unbroken save by the occasional train that hurries through as if afraid of the miasma. But the Campagna once passed, a different scene is entered as suddenly as the Eternal City is succeeded by the Campagna.

The train, as it leaves the Campagna and begins to climb the spurs of the Alban Hills, enters a region clad with the silver green of the olives, whose gnarled and blighted trunks seem but little younger than the aqueducts and ruins of the Campagna. To this succeed the vineyards, where the vines, climbing from one ilex tree to the next, ripen their grapes on the sunny hillside—for all these places are famous for their wines, and Frascati, Tivoli and Marino are names well known to the epicure.

Finally the foot of the mountain is reached, and the traveller climbs the steep hillside and finds himself in the thriving village of Frascati.

It is not strange that the wealthy members of the papal aristocracy were not slow in recognizing the beauty of the site of the ancient Tusculum, which in former times had witnessed the delights of Lucullus, and that they here erected the many splendid villas to which they retired when, the heat of the summer having abated, they were able to leave their castles in the north of Italy, but were as yet unable to enter the heated and unhealthy city.

From the hillside an uninterrupted view over the Campagna may be obtained which reaches to where, in the far distance, a faint blue line marks the waters of the Mediterranean.

To the north and west rise the wooded slopes of the Sabine and Umbrian Hills, while before us lies Rome, whose domes and towers are plainly seen in spite of the fourteen miles of desolation which lie between the Alban Hills and the Eternal City.

The atmosphere of Rome is peculiar to itself. Nowhere else, save in the landscapes of Claude de Lorraine or Gaspard Poussin, can one find the clearness and yet softness, the ideal light which reveals the masses while it hides and softens all that might be hard or unsightly in the outlines.

A peculiar vapor rises in the distance which seems to unite the plain, the mountains and the sky in one harmonious whole, where tint succeeds tint, and the colors by insensible gradations merge into one

Aldobrandini, the nephew of Clement VIII. Like most of the suburban Italian villas, the exterior is of little importance as compared with the grounds in which it is set. Behind the villa is a higher terrace, at the level of the principal story, from which a grand vestibule leads to the larger apartments. The kitchens and other dependencies are placed in one-story wings on either side of the main building.



THE FOUNTAIN AT THE THIRD TERRACE, VILLA LANTE, BAGNAIA.

These open on the lower terrace, while their roofs, decorated with balustrades, statues, fountains and orange trees, form esplanades bounding the upper terrace. Back of the casino, on the opposite side of the terrace, is an imposing loggia with a semi-circular centre, forming, as it were, an amphitheatre, the niches of which are filled with fountains and statuary; behind this is a gallery decorated in mosaic and fresco. Here one may walk in the cool shade, surrounded by flowers and green plants and charming works of art, while the ear is delighted with the splashing of the cascade without.

Far up the hillside is the grotto from which issues the stream which supplies the entire park with waters innumerable. The arrangement of the chateau d'eau is the work of Giovanni Fontana and

Orazio Olivieri, landscape gardeners and architects. The waters, issuing from the grotto, are collected in a broad basin, and are then conducted through open stone cisterns or channels to the cascade in the rear of the casino. These stone basins are employed in many of the villas, in which water plays an important part in the adornment of the park. They are raised several feet above the ground, and are built at an inclination. Down this the waters rush swiftly in a narrow stream, which is broken into innumerable little cascades by impediments placed in the stone bed. Another favorite device is to lead the water by a succession of stone basins, each of which, receiving the water from its predecessor, discharges it into the next through the mouth of a mask, the nostril of a dolphin, or by a mimic cascade rippling over a carved sea shell. On either side flights of stone steps, here and there adorned with a fountain, follow the course of the stream.

What a heritage of delight have these princes of the Renaissance, who in their day cared only for themselves, bequeathed to posterity, and how much less attractive were those gardens as their owners built them than they are to-day, for, after all, we must acknowledge that the charm is due as much to the kindly touch of nature as to the skill of man.

The amphitheatre, now so charming in the green mosses which hang to the walls of grottos and clothe the limbs of centaurs and of fauns, must have been less attractive in its coat of gaudy stucco, and the statues, in their dazzling whiteness, unsheltered from the lightness of the Italian sky, must have had a different character from the shy creatures which peep from their shelters of clinging vines; nor could the trim balustrades, the fresh vases and the new marbles have had the charm of color which makes them blend so happily with the russets and greens of their surroundings.

The abandonment and neglect of their owners detract but little from their old magnificence, while the silence which reigns in these delightful places but adds to their attraction.

Adjoining the grounds of the Aldobrandini are those of the Villa Conti. The casino is architecturally unimportant, and its only attraction lies in the magnificent rose trees which have been trained against the walls, which they almost conceal in a bower of fragrance.

These trees, centuries old, reach to the highest cornice and cover the walls with a shower of red and yellow Roman roses. I have seen these trees in midwinter, and found them still bending under their load of blossoms.

I imagine that this building was but a temporary affair, for the four great flights of steps, each some twenty feet broad, and flanked with balustrades of stone, which lead to the broad terrace on which no building stands, as well as the elaborate treatment of the grounds,

would imply a more pretentious casino than the present building; if so, it was the wiser course to begin the gardens and plant the trees before commencing the building. The park is perhaps the most attractive of those at Frascati, for the trees are superb, and the arrangement of the ramps and terraces and the nymphaea and cascades, while less formal than those at Aldobrandini, are not less elaborate.

Adjoining the Aldobrandini on the other side is the Villa Rufinella, the property of Prince Lancellotti. The casino, built by Vanvitelli on the site of the Academia of Cicero, is architecturally of little interest.



VILLA CAPRAROLA.

In the park are some wide walks shaded by ilex trees. These, planted in two parallel rows some twenty feet apart, have formed an arbor by the meeting of their branches. They are kept carefully trimmed, so that the sides and top form thick walls of vegetation, which present, from the outside, the appearance of a gigantic hedge. I have seen the same treatment of box hedges in England and France, but the greater size of the ilex trees permits a broad walk instead of the simple passage.

The Villa Taverna, designed by Gerolamo Rainaldi for the Prince Borghese, has a casino whose forbidding exterior gives no

hint of the charming gardens which in the rear rise from the casino in a great amphitheatre upon the hillside. Beyond these gardens avenues of orange, laurel and cypress lead to the adjoining villa, also the property of the Borghese.

The Villa Monte Dragone, the most pretentious of the Frascati villas, was built in 1567 by Martino Lunghi for the Cardinal Altemps, nephew of Pius IV. Pope Gregory XIII. made extensive additions to the villa, which was finally completed by Flaminio Ponzio and Giovanni Vasanzio for Paul V. and his nephew Scipio Borghese.

Architecturally this is the largest and most magnificent of all the Roman villas. The main palace measures 320 feet in length by 108 feet in depth. It is a two-story composition, behind which is a square court of great size, enclosed on one side by a gallery, richly decorated with paintings, and on the other by a two-story wing containing suites of apartments. Behind this again is an oval terrace, adorned with niches and statues, which seems to have been intended for athletic exercises. At the rear is a large garden enclosed by walls and entered by a two-storied loggia of some elegance, opposite which is the elevated terrace, approached by a double flight of steps, and having in the centre a semi-circular gallery or amphitheatre.

This is a favorite decorative device which is found with unimportant variations in many of the villas.

Before the casino is an immense terrace built upon the dependencies below, for, the hill being a very steep one, the casino is two stories higher on this side than on the court façade. From this terrace a superb view across the Campagna can be enjoyed, with the domes of the Eternal City rising in the distance.

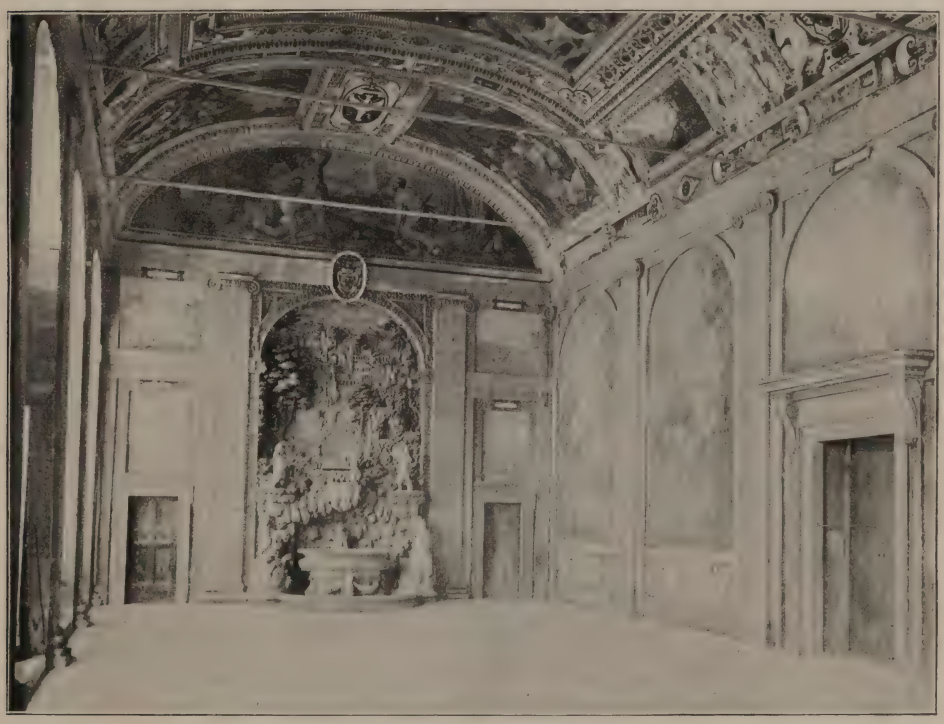
Even in the days of their prosperity the Borgheses neglected this villa, preferring to live at the Villa Taverna. To-day it has passed into the hands of the Jesuits, who have here established a school for boys.

It was a sad sight to see the magnificent court and richly decorated galleries filled with the not over-clean children and resounding with their shrill Italian voices, for it was the hour of exercise, and some fifty boys, each with a hoople, were giving chase to a young Jesuit priest, who, with his cassock and rosary flying in the wind, was trying to protect his hoople from their assaults.

It is unnecessary to describe the villas of lesser importance, such as the Villa Muti at Franscati, the Casino Colonna at Marino, the Villa Guistiniani at Bassano or the Parco Chigi at Ariccia. All are charming and, in a country less filled with masterpieces, would excite interest.

The Villa Barberini at Castel Gandolfo is remarkable as approaching more nearly than any other to the ancient suburbanum. It occupies the exact site and in many ways follows closely the gen-

eral plan of the great villa which the Emperor Domitian built on the west slope of Lake Albano to unite the villas of Clodius and Pompey the Great. The ancient walls, the huge arches supporting the terraces are still there, but hidden under a thick covering of vines and evergreen. The owners have prided themselves on fostering the resemblance, and no tree or plant is allowed a footing but those which adorned the gardens of ancient Rome. The ilex, pomegranate, yew, cypress, stone pine, laurel, fir and myrtle furnish a sufficient shade, while roses, violets, crocuses and hyacinths are the only flowers. Along the walks are architectural fragments of beautifully carved



THE LOGGIA, CAPRAROLA.

marble which, with the columns, statues and niches, once adorned these gardens of Domitian.

Perhaps the villa which is most widely known is the Villa d'Este, at Tivoli. This was commenced about 1540 by Cardinal Hippolyte d'Este. After having passed from one member of the house of d'Este to another it finally became the property of the Dukes of Modena, who valued their heritage so lightly that they sold many of the more famous statues which adorned the grounds to Benedict XIV., who placed them in the Vatican.

The exterior of the casino was never completed, but seems to have been prepared for a veneering of marble, which it never received. It

is an uninteresting structure, with a frontage of 180 feet, and stands on the brow of a steep hill.

The gardens occupy the entire hillside, and present at every step an infinite variety of treatment in which every device known to landscape gardening seems to have been exhausted.

The lower portion is treated as a garden, in which rose trees have run riot for many years. In the centre of the parterre, surrounded by yolk elms and cypresses of great size, a fountain throws its stream to a great height, while between the cypress trees smaller fountains are disposed. From this lower garden the whole arrangement of ramps is visible, which lead to the great terrace some 600 feet in length on which the casino stands.

At every crossing of the ramps is a small terrace, the back of which is filled by a small grotto, in which a fountain throws its waters against the dark background of the dripping water plants. A broad canal, crossed by bridges and enclosed within a marble balustrade adorned with vases and statues, receives the waters of a cascade, which, issuing from a little marble temple, pours over a steep ledge of rock. The little temple is placed on the very edge of the cliff in order that it may be reflected in the pool beneath.

Four ramps lead from the lower garden to the main terrace, all of which are bordered by little rivulets, conducted in marble basins, while the broad walks which cross the hillside from right to left are walled by continuous basins of marble, into which a succession of tiny jets discharge from lion heads, masks and statues set in the marble backing. At every turn one finds grottos in rockwork, presided over by the divinities to whom the fountains are dedicated, pavilions, temples and swimming pools.

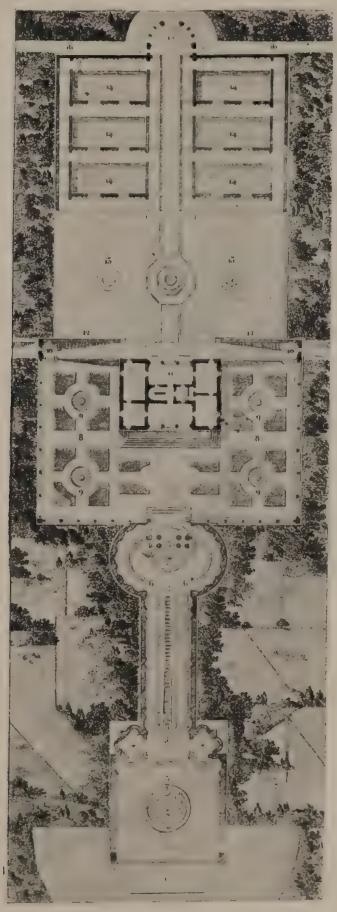
Everywhere water is used in the most varied manner, now pouring from the mouth of some monster or issuing from a little temple and falling in a great cascade into a basin, again thrown to a great height or bubbling down the hillside in the marble cisterns. Everywhere are statues, not remarkable as works of sculpture, for the best have been carried away to adorn the endless galleries of the Vatican, but charming in the coating of moss and lichens which hides their deficiencies.

Some of these are placed symmetrically to adorn the walks or to be doubled by reflection in some quiet basin; others are set picturesquely on the summit of a rock in the cool shade of a grotto.

A huge colossus, fallen and broken, has stretched its length for centuries beneath the shrubbery. Diana of the Ephesians discharges a hundred tiny streams from her innumerable breasts. Nile gods and the giant Tiber watch complacently their stony offspring, while forgotten divinities still find in this delighful retreat their temples and grottos.

All are charming, but their attraction is not one which can be conveyed by words or by an enumeration of their beauties.

To the admiration which these gardens have inspired we owe the many charming gardens of France, the glories of the Tuilleries and the Luxembourg, of St. Cloud, Versailles and the Italian gardens of many of the chateaux of Touraine. If to them can be traced the inspiration which has given us the gardens of many a quaint Eliza-



PLAN OF THE LITTLE CASINO AND THE PARK, CAPRAROLA.

bethan manor, we must also hold them accountable for the absurdities which characterize many of our modern parks and gardens.

For us, in America, it would, perhaps, have been better if the gardens of Italy did not exist to enthrall the traveler with their sensuous charms, for to them we owe the unhappy attempts at imitation which find expression in the cheap substitutes for real magnificence—the zinc statues, the fountains in which the feeble stream seems glad to hide itself in the cast-iron basins, the stags and ferocious mastiffs of

bronzed iron, the century plants in cheap vases, the bogus statues, ugly pavilions and summer houses which seem a necessary adjunct to our private gardens and public parks.

Sickened by these horrors, we have argued from the abuse against the use of classic gardening, and have now gone to the opposite extreme; abandoning all attempts at an architectural treatment, we have taken refuge in the freedom of the English landscape gardening.

Our roads must now be winding and our paths must twist in a thousand contortions in as many yards, our trees must go untrimmed and our shrubbery unbridled. We make little pools that a ray of sunshine would dry up, and call them lakes; we build little bridges of rustic work to cross our stagnant streams, and sit on benches made of twisted roots or gnarled branches, which are as awkward to look at as to sit upon. We drag rocks from a distance and heap them up on our lawn to form a rockery or fernery, we transplant strange trees of ungraceful shape, and force others to grow which are unsuited alike to our climate and their surroundings.

In the disorder of our imaginations we confound the attributes of everything and forget good taste. On rare occasions we study the works of the great masters of the past, and of late we have produced much of which we have just reason to be proud.

Happily the horrors of the anti-centennial period are giving place to better things in landscape gardening, as in architecture and other arts, and with extended travel and study our landscape architects are prepared to give us something better whenever we are ready to receive it.

Marcus T. Reynolds.



FIG. I.—AUBERGE DE TREIB. Lake of Lucerne.

SWISS CHALETS.*

II.

ONE of the finest examples of châlet with large pointed roof is furnished by the old Inn at Treib (Canton of Uri), a historic edifice on the bank of the Lake of the Four Cantons, at the Seelisberg station, opposite Brunnen. It dates from 1650 (Fig. 1). The photograph was taken in the Swiss village of the Geneva Exposition, where this inn was exactly reproduced. It is one of the most interesting and most picturesque of châlets, and it enables us to complete the knowledge of the wooden constructions which we derived from the Fischenthal and Stanz châlets.

The general appearance is extremely light and easily-read, the structure and decoration of the front indicating the internal divisions and the play and bearing of the joists. The situation itself of the inn is charming. The front overhangs the lake and is built on piles, while the body of the house rests on terra firma. The roof, covered with thatch-planks, rises with a steep slope. It is, in fact, the Fis-

*See Architectural Record, Vol. VI., No. 4, for Part I. of this article.

chenthal system of protection against rain, and the projecting eaves shelter the front. Note should also be taken of the useful part played by those large brackets upholding the projecting part of the roof, and of the ornate pendentives which terminate them. The architects of these wooden edifices never fail to extract a decorative effect from the indispensable elements of the building. As we have already remarked, instead of seeking to minimize the external part held by the framework of the building they have in every instance emphasized it and given it the greatest possible development, so as to produce a decorative effect. Note, in this connection, the dormer window in the roof. It is in itself a complete piece of architecture. The shape of its covering suggests the entire roof. It, too, has its brackets and pendentives, and thus, out of a necessary opening in the roof, the châlet architect has had the skill to make an important element of architectural decoration. Hereby wood architecture teaches a useful lesson which her elder sister (or offspring, for is not all architecture descended from wood?), stone architecture, and her younger sister, iron architecture, too often forget.

The Auberge de Treib further interests us from the double point of view of its decoration and its sheltered front. We have already referred to the beautiful ornamentations in carved wood which are so appropriate to wooden edifices. Here, too, the window-frames are in finely carved wood; but we find, in addition, the application of decorative painting to the façade. The bands surrounding the windows and the panels below, comprised in these bands, are painted in wide stripes of yellow and black alternately, the national colors of the Canton of Uri. This has been done with a truly intelligent conception of decoration. The whole front is not painted. The vertical beams, which project and intersect each other at the angles, as well as the boards on the wall, are left bare, only the bands enframing the windows and panels, and the panels themselves, being painted. The radiating black and yellow stripes give life to the front, and the whole arrangement is highly effective. This is very different from the fronts of wooden houses in the United States, with their flat, uniform tint. In this case again it is the natural tone of the wood which predominates.

The system of protecting the front is also interesting in wooden constructions, and the Auberge de Treib furnishes an excellent example. At every story a penthouse, resting on small brackets, runs along the front above the windows, the horizontal framework of the châlet and the upper part of the windows being thus protected from the rain. These penthouses not only shelter but are decorative as well, as they accentuate the division of the building into stories. This arrangement is very common in châlet construction in Switzerland, and we shall come across more than one example of it in the course

of this study. It is not merely fancy that has led architects to introduce this important feature into châlet-building; they have been brought to it by logical necessities, by the climate, and by the material chosen for the construction. They were using wood, and that in a country where rain falls frequently; consequently, the first thing to do was to arrange the edifice in such a manner that it should suffer as little as possible from bad weather by finding means to prevent the rain from reaching and damaging the foundations. Hence the great outward extension of the roofs over the fronts, the penthouses above the windows, and the almost excessive prolongation of the



FIG. 2.—WINDOWS WITH PENTHOUSES.

roof-line beyond the lateral walls, the roof sometimes reaching, as we shall see, to within a few feet of the ground, where it is upheld by posts. Hence also a number of excellent arrangements, examples of which will be found in the châlets described below. For instance, the balconies or galleries are always on the upper story of the châlet, where they enjoy the shelter of the roof, and the stairs and sometimes the galleries also are placed outside the house, where the projecting eaves cover them entirely.* We have a variety of protective measures intelligently combined for the purpose of ren-

*See the fine Chalet at Stanz (Fig. 3) as to the position of the stairs and galleries.

dering the châlet as durable and healthy as possible. Necessity has created this system, and the builder's art has managed to obtain the happiest architectural effects from it.

In Fig. 2 we give a series of windows protected by small penthouses, which form a continuation of what we have said relative to the protective system, and, earlier, as to the decorative part held by the window in wood construction. These models, which are taken from Varin's work, already cited, are extremely pleasing, and their composition is excellent. Architects will be able to find inspiration in them. For country houses they afford an element of variety and picturesqueness which should not be ignored.

* * * * * * * * * *

Let us now pass on to the important class of châlets with flat roofs. In the Fischenthal, Stanz and Treib châlets we have had three remarkable types of large, steep-roofed châlets, and the illustrations convey a clear idea of the beauty of that system, both from a picturesque and an architectural point of view. The ascending lines of the roof give great elegance to the edifice, and, besides, for climates where rain, rather than snow, is to be feared, the said type is logical and thoroughly rational. But in many parts of Switzerland—in most parts, in fact—the winter brings snow and rain, and this has caused a modification in the principles of construction. Instead of seeking to get rid of the snow and prevent it from accumulating on the roof, every effort is made to keep it there; it is wanted to collect and form a thick blanket, protecting the house from the intense cold of the winter nights. The line of the roof is, therefore, lowered and brought nearer the horizontal (see the Berlingen Châlet). There is evidently a loss in picturesqueness, but there is a gain in protection, and also, as we shall see later on, in convenience of internal arrangement. In any case it is a new and very interesting system. Often beams are placed perpendicularly to the front in order to retain the snow and prevent it from sliding.

In châlets of this type the exterior decoration is very elaborate. The fronts have rich friezes in bold relief, whose decorative character offers the greatest interest. We may take, for instance, the Auberge de la Croix Blanche, at Montbovon (Canton of Friburg), which is a good example. Along each story there runs a frieze formed of a regular series of little arcades, reminding one of the Lombard bands which so often figure in Romanesque and pre-Romanesque art. These accentuate the interior division of the house. It should be noticed here—and succeeding illustrations add to these examples—how completely the decorative spirit of châlet builders has held itself aloof from the progressive movement of architectural decoration in stone construction. Those neo-classic ornaments which were then the only ones admitted in stone architecture, are met with simply as

exceptions. The châlet-builders have just followed the ancient lines which they knew and liked; they have continued the immemorial traditions of their ancestors, and have delighted in the ornaments which found favor in the sight of their predecessors of the Middle Ages. Thus have they kept alive in their little corner of the world some portion of that which constituted the admirable essence of the

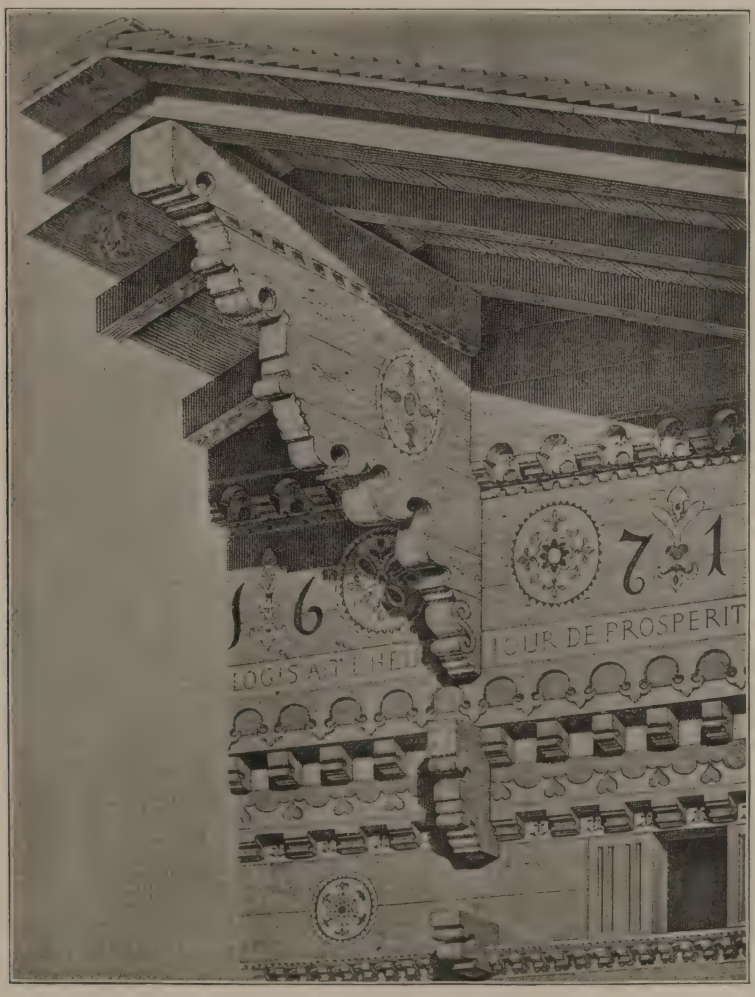


FIG. 3.—DETAIL OF CHALET AT LA FORCLAZ, VALAIS.

art of the said period, and their painted and carved fronts tell us better than political history can do what those inhabitants of Switzerland were and what kind of life was theirs. It is in Romanesque art—in our French cathedrals—that we shall find the prototypes of the friezes on Swiss châlets of the seventeenth and eighteenth centuries.

Furthermore—and this is a point on which we must insist—these façades present in most cases a double decoration; the carving is reinforced by painting. It is interesting to see how, as in the Middle Ages and the ancient Grecian, the decoration is incorporated with the architecture and is not a thing apart. Viollet-le-Duc, speaking of the role of architectural painting, says: "The painting, which is essentially a part of the architecture, is subject to the lines, forms and design of the structure. . . . It was only at the Renaissance that the painting became a separate thing from the architecture." It is evident that, for the painting which we see on Swiss châlets, the Renaissance had no existence. It accentuates the reliefs of the friezes, adds force to the shadows and brightens the light parts. In the plane and empty spaces of the front, and on the flat sides of the consoles, it expands in beautiful roses and daisies, of a highly decorative character. Roses have been the favorite ornament of châlet-builders. One finds them again and again (see illustration further on). They are certainly of Eastern origin. Finally, to complete the front and give it full importance, a dedication or a citation from the Bible is engraved on it, calling down the heavenly blessing on the dwelling. Nothing could be more serious than these large inscriptions running from story to story, in simple, unaffected language.

Fig. 3 shows part of a front and the central beam of a châlet at La Forclaz, Valais, with the date and a portion of the inscription. Here one can grasp more clearly the character of the carved and painted ornamentation. It is a fine example of its kind. The bracket supporting the principal beam is also of excellent style and one of the best models of carved wood. This châlet dates from 1671 and belonged to Jean Tille. We borrow our illustration from the justly-esteemed work by Gladbach, "Holzbauten der Schweiz." In this châlet, as in that of Croix Blanche, which dates from 1725, note should be taken of the extension of the beams over the front. This is one of the characteristic features of wood construction. Lastly, before finishing with Montbovon, we will recall what we have already said in regard to the windows and their grouping, so ingenious and symmetrical, in the façade.

The next châlet, which is very near to the Auberge de la Croix Blanche in its architecture and decoration, also comes from Montbovon, where it was purchased by the authorities of the Geneva Exhibition. It dates from 1668, and is therefore half a century older than the other. Fig. 4 affords a general view of it as reconstructed in the "Swiss Village." The little châlet which is seen beside it is the oldest of all those figuring at the exhibition (Châlet de Broc). It was built in the year 1590. This is one of those small châlets of the village of Gruyère in which the cowherds store their utensils. This châlet also was bought for the exhibition. There we may get an-



FIG. 4.—CHALET AT MONTBOVON.

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other view of the façade of this same châlet at Montbovon which enables us to better understand its structure and decoration—the plank walls, the joints of the framework, the arrangement of the windows, the far-projecting eaves, and, above all, the relief of the carved decoration, the character of the painted decoration and rosework, and, finally, the carving of the large consoles which support the roof. All these features explain themselves and do not call for any comment. The visitor will also remark the very graceful arrangement of flowers placed upon shelves on the second story of the front.

The Châlet of Iseltwaldt (Fig. 5), which stands on the border of Lake Brienz (Berne), belongs to the type most frequently seen, and which has been popularized by the wood-carvers of the Oberland. It is certainly less elegant than that of Fischenthal, but it has the merit of presenting in a clearly-defined manner the characteristics of the flat-roof châlet. The two galleries are on the second story, at either side, under the shelter of the roof. The stairs on the front is a feature met with less often. The roof is covered-in with shingles, and the chimney is stunted. From an architectural point of view, note should be taken of the lengthening of the principal brackets, which start from the bottom of the front. This extension, the effect of which is very happy, is produced by the projection of the corner and middle beams, as will be seen from the next figure (No. 8), which gives a side view of the same châlet. The composition of the windows here is, as usual, very pleasing. In the side view the system of crossing the corner beams is clearly apparent, and we are also better able to judge of the carved decoration, which in this case is particularly rich and elaborate. The side view further enables us to form an opinion as to the relief of the decoration and as to the ribs of the façade. Everything is in excellent proportion. One great merit of wood architecture is that it is never afraid of high relief; an ornament is never flat or timid; everything, on the contrary, is of suitable strength for the play of bright parts and deep shadows. The ground floor of this châlet is in stone. The foundations and sub-basements of châlets are nearly always in stone, but the stonework does not often rise high enough to form a story. A châlet at Champéry, in Valais (Fig. 23), presents, however, the same peculiarity. As to its other features, this edifice resembles the Iseltwaldt Châlet in structure, but is distinct therefrom in the character of its ornamentation. The small columns in the balconies are of turned wood, a circumstance sufficiently rare to deserve mention. Notice will doubtless be taken of the position of the large balcony, viz.: on the upper floor, where it is sheltered by the eaves.

We may notice, although it is not connected with this class, a châlet at Saanen, Canton of Berne, whose steep roof, with canted gable-end, projects to an enormous extent. The chimney is mon-



FIG. 5.—CHALET AT ISELTWALDT.

umental, and is covered by two movable boards which are raised and lowered according to the direction of the wind. This fine chimney is to be coupled, from an architectural point of view, with the large dormer windows of Trieb and Stanz.

Such are the two classes of buildings presented by wood architecture in Switzerland. The types we have given exemplify all their important elements, both from an architectural and a decorative standpoint. Everything we have examined fully justifies itself from a historical point of view. From a practical point of view the utility is less direct—we mean that, while the finer Swiss châlets supply us with excellent models of decoration of picturesque fronts and elegant roofs, there cannot be any question of our copying exactly either Fischenthal or Treib. The comfort-loving people of the nineteenth century would not be at ease in the rather confined limits of a Swiss châlet of the seventeenth or eighteenth century. However, the lesson taught by these châlets is all the higher for being of less direct use. They show us how the carpenter-architects extracted, with great logical force, their entire system from the character and qualities of the material they employed. Their architecture is real and not borrowed; it does not come from elsewhere. This is a fundamental quality in architecture.

Before broaching the entirely modern part of our subject and giving some châlets of the present day, which, while comfortable and adapted to our needs, remain true to the old spirit of wood architecture, we desire to mention a few types of small, light constructions which are capable of being at once utilized for our purposes, either as a pavilion in a park, a gatekeeper's lodge at the entrance of a large estate, a hunting lodge, or a gamekeeper's house. We shall then give a model of a mountain residence, built as far back as 1754, and shall show the wood architect's conception of a farm house. After that we shall pass on to the interior of some châlets and see what is to be learned there that will be useful for our modern dwelling houses, and the good or bad points of that kind of building. This examination of modern effort in wood architecture will show us what use has been made of the teachings of the past, and in what direction should tend our endeavors to perpetuate the charming art of châlet building.

Let us take, in the first place, notice of a little châlet, which is a gem of elegant construction and decoration. It is an original specimen of a châlet at Brienz-Wiler, in the Berne Oberland. Just as it is, it would make an extremely picturesque porter's lodge at the gate of a country place in a hilly district. The balustrades, carved in openwork, and the friezes along the front and around the windows, are in the purest possible taste. This châlet was transported bodily from Brienz-Wiler to the Geneva Exposition. The actual dimensions



FIG. 6.—CHALET AT MARPACH.

might be adhered to; in fact, this is a somewhat important point, as Swiss châlets would suffer greatly by being reproduced on a larger scale, so complete is the harmony between their dimensions, their structure and their decoration. But the small houses here shown can answer certain purposes without undergoing any modification.

The châlet illustrated in Fig. 6 is situated at Marpach, Canton of Berne. It is an original and charming model. The upper story is larger than the ground floor, exceeding the latter considerably on both sides. The front thus offers a very curious appearance, the charm of which is heightened by the immense circular opening, which pierces the covered gallery and gives light to the chamber. The cant on the end of the sharp gable shelters the gallery, and a penthouse protects the windows of the ground floor.

A châlet at Langnua, Canton of Berne (Fig. 7), furnishes again



FIG. 7.—CHALET AT LANGNUA.

another example of the vivacity and elegance of architectonic forms in wood construction. Upon a rather confined ground-floor which can scarcely be used for any other purpose but the storage of fruit, cheese, etc., stands a larger first story resting in the simplest manner on the big transversal beams of the ground-floor prolonged on each side of the house. Then there is a gallery running round the edifice, with large carved gallery supports upholding semi-circular arches. On the upper story another gallery, with a deliciously carved balustrade, takes shelter under an enormous roof with a cant, the eaves being sustained by heavy consoles. It is charming to see to what good account the ingenious decorator has turned such an original structure, how he has united the first story and the ground floor by a carved ornament, and how cleverly he has conceived the arches of the gallery and the balustrade near the roof.

We repeat that the three models just presented and which are all exquisitely graceful, appear to us susceptible of being utilized for country places as pavilions or porter's lodges.

With the large châlet at Rossinières (Vaud), shown in Fig. 8, we enter into a different domain. The châlets hitherto shown have been of middle size and scarcely capable of containing more than a single family. Here, on the contrary, is a châlet of such ample dimensions that it might serve as an hotel. It dates from 1754, and a long inscription of seven lines which runs along the front informs us for whom it was built, and calls down God's blessing on the founder and on its subsequent inmates. The façade offers the same series of little arches already familiar to us, painted ornaments, the owner's arms, and animals, such as stags, lions, and so forth. The large roof-brackets also extend downward to the first floor. We again see here, applied on a large scale, the fundamental principles of wood architecture. It is of the high, pointed roof type. Here, too, the gable has a cant, in order to avoid the acute angle. The ascending lines of the roof are fine and the house really seems to be sheltering itself under its enormous covering. But with this system of roof, descending on each side almost to the earth, the lateral faces of the houses are sacrificed; everything is in the front, whereas in the flat-roofed châlets the more horizontal roof-lines admit of side windows on the first floor and a gallery, covered by the roof, on the second story. (See the Iseltwaldt Châlet, Fig. 5.) We shall find, however, how well the builders have managed to take advantage of this situation and what a practical sort of edifice they have evolved out of the steep-roofed châlet. In the example before us they have left the façade for the dwelling rooms; it can be carved and painted, and it is there that the tenant and his family live. At the side, the architects have seen that the overhanging roof might be utilized to shelter tools, carts, ladders, plows and other farm implements. It forms an excel-



FIG. 8.—CHALET AT ROSSINIÈRES.



FIG. 9.—FARMHOUSE.

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lent storing-place, and we thus come to the type of farm-châlet, of which Fig. 9 is a specimen. It is a Bernes châlet, with high roof and canted gable, the gallery being protected in a curious manner by a large arch. The overhanging part of the roof is boarded-in, so that the gallery is completely sheltered. On the front are the windows of the dwelling apartments, and at the rear the farm buildings, properly so called. The loft formed by the elevation of the roof serves for storing fodder. This châlet is evidently the abode of a well-to-do farmer, but what should be specially noted is how, while having a dwelling that is practical and suited to the requirements of his kind of life, he has at the same time a house possessing style, individuality and harmony. All this he has got without trouble by faithfully following a national tradition, by continuing a style which he knew, by applying without great efforts the principles proper to the material chosen by him, the fundamental rules of wood construction; and in this way he has obtained something that is architectonically satisfactory. This type is very frequent in wood architecture in Switzerland.

We also give views of two other Bernese farms (Figs. 10 and 11) of similar type. They are more rustic, their decoration is less elaborate, but their principal lines are interesting. The roofs are of the same kind as those just examined.

THE INTERIOR.

It is certain that we could not accommodate ourselves to the interior arrangements of Swiss châlets of former centuries. The rooms are small and low, varying from 6 feet 7 inches to 7 feet 6 inches in height, and the hygienic condition which we insist upon in modern houses are non-existent, for there is an absence of air and an insufficiency of light. The agriculturists, farmers, or cattle-breeders who inhabited them lived in the open air, in the fields or on the mountain pastures, and they therefore required less comfort and less hygiene than we do, as they were only at home during meal times and the hours of repose. In our different conditions of existence, we could never live in their dwellings. The smallness and lowness of the rooms spring from the intrinsic necessities of the building, the system of framework and planking. Still, while rejecting the idea of keeping the inside of the châlet just as it is, we can retain some of the essential principles.

First, the decoration in wood. We have a house built of wood; let us decorate the interior of that house with the same substance; let us use it for the ceilings, where, quite naturally, without anachronism, and without infringing good taste, the beams will be left visible; for the flooring, where one can obtain the richest effects; for the



FIG. 10.—FARM IN THE CANTON OF BERNE.



FIG. 11.—FARM IN THE CANTON OF BERNE.

staircases, rails and balustrades, of which we have so many fine models in carved wood; and finally, for the wainscoting. In this manner we can have a charming decoration which will be uniform without falling into monotony. As a matter of fact, the different kinds of wood allow a great variety of color in the principal tones of the rooms and in the arrangement of the panels. Fir, the tonality of which is very agreeable; larch, which is richer and takes an admirable patina, and pine, which is redder, can form the ground-work of the decoration, while oak, beech, walnut, birch, pitch-pine, etc., might each play a prominent part in producing any desired effect. It is also possible to arrange the different kinds of wood, so as to avoid monotony. Besides, wood lends itself to all kinds of work; it can be moulded, carved or fretworked with the greatest facility. Hence its immense field for decorative purposes. Lastly, as wood architecture makes use of painted decoration for the exterior, so does it utilize the same for the interior. We have seen painted friezes of leaves and fruit in the common room of the châlet, and we also see painting lending its aid to architecture by strengthening the cornices, ornamenting the mouldings and enhancing the reliefs on the walls and ceilings.

We give a view of a room on the ground floor of the Montbovon Châlet (Fig. 12), purchased for the Geneva Exhibition. It shows the effect of the painted decoration, which, however, is not first-rate in this example. But what is excellent in the Swiss châlet, is the place held by the various articles of furniture; they positively form a part of the room and its decoration; they are not intruders; they have not the appearance of having been dragged in without rhyme or reason, as is often the case with the furniture in our apartments. As a rule, the dresser forms part of the woodwork. We reproduce two models of dressers (Nos. 12 and 13), but they have been placed in rooms to which they did not originally belong. In the Historical Museum at Basle there are several sixteenth and seventeenth century rooms, where the truth of the above observations can be verified. The dressers here shown are interesting as samples of woodwork, although they bear visible traces of the influence of the German Renaissance. They are very practical pieces of furniture, with cupboards for bread, glassware, china, table services, and, besides, with a washstand. The brass ornaments are always in their proper places. The pitcher and basin are generally made of block-tin. The shape and ornamentation of these dressers are good, and they are one of the excellent creations of Swiss woodworkers.

In the room in the Stanz Châlet (Fig. 13) the woodwork only reaches to mid-height; a garland of fruit and foliage runs around the apartment under the cornice of the ceiling. The woodwork itself has received a painted decoration quite in the taste and spirit of wood



FIG. 12.—ROOM IN CHALET AT MONTBOVON.



FIG. 13.—ROOM SHOWING DRESSER IN STANZ CHALET.

architecture. The tables and chairs are in harmony with the room; they are inspired by the same decorative spirit that conceived the châlet and its ornamentation. This is no slight merit, and we ought to be the more sensible of it as we are so far from having a logical conception of the art of furnishing. We are crazy after bric-a-brac; the Middle Ages, the Renaissance; the Louis XV. and the Louis XVI. styles of furniture are mingled together in our houses with English, Japanese and other styles; the upholsterer and the archaeologist share equally the honor and profit of supplying us with furniture. Therefore, we are truly delighted to see a room having a unity and a soul, repeating, with variations, the external decoration of the house itself. Seeing the room, we can picture to ourselves the house, and vice-versa. The dressers are one with the wainscoting, of which they seem to be an extension. On their panels are the same ornaments that appear on the doors and other woodwork. Against the wall there is a breadsafe in carved wood, simple and ornate withal, like the whole châlet. The table, the chairs, the spinning-wheel near the stove—everything, in fact, declares a common origin and speaks of one life, one family, the continuity of one spirit and one taste. There is reason to fear that at the rate we are going, and accustomed as we are to flats, and especially hotels, with the unfortunate facilities they afford us of changing our surroundings every two or three years, if not every two or three months, we shall become indifferent to the charms of an abode which was that of our parents and grandparents before us, and where, after our time, our children in their turn will dwell. That is what the Swiss châlet has been, and for this reason it is regarded with affection.

Before concluding we have still to see, in the interior of the châlet, another of those happy achievements of wood architecture; we mean the effect from within of the groups of windows, whose value as an element in the decoration of the façade we have already mentioned. The examples given here show with what ingenuity and with what art the châlet builders conceived the window. We have called attention to double windows and three-twin windows, as well as to the frames enclosing them. We have spoken of the necessity of windows being low in wooden houses. From the inside, the effect of these groups of windows is equally pleasing. Generally, the inside frame corresponds to the external one. A frieze unites the windows that are near each other and makes a set of them. An example of this may be seen in the interior of the Stanz châlet. Very often, too, a seat extends from the wainscoting and is comprised in the frame of the group of windows. The room remains light, and the effect of the double or triple windows is as good from within as it is from the outside.

THE MODERN CHALET.

We desire now to mention a few points in connection with the wooden houses at present in course of construction in Switzerland. It should be observed, in the first place, that modern châlets are built for a different class of people from those for whom they were

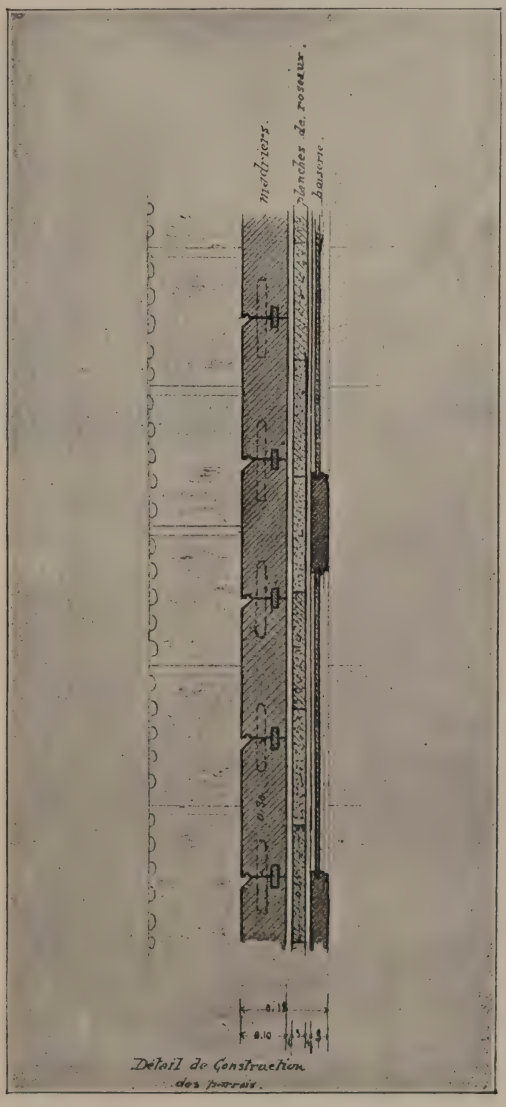


FIG. 14.—SECTION OF WALL OF A MODERN CHALET.

built in the past. Formerly they were erected for farmers and well-to-do country people. Nowadays they are country residences for the moneyed classes. They must be provided with more comfort and refinement; the rooms must be larger and higher, and the sur-



FIG. 15.—CHALET, LAKE GENEVA.

roundings better adapted to the exigencies of modern life. The models we have examined need to be transformed, but these modifications are not fundamental and do not affect the principles which have been applied by châlet architects in such charming ways. To-day, as in former times, wooden houses, to be architectural, must conform to the old conditions; architects ought to remain faithful, not to the letter, but to the spirit of wood architecure.

The later-day châlet is built entirely of wood, only the foundations being of stone. Fig. 14 is a section of wall of a modern châlet. The exterior part is formed of madriers, 4 inches thick, the inside face of which can be covered with thick building paper. At an interval of 1-3 inch there is a bed of reed-planks, formed of reeds, tied together and joined with plaster. This is an excellent non-conductor. It is 1 inch thick. This, too, can be lined with a layer of building paper. Lastly comes the interior wainscoting, 1 inch thick. This makes a total thickness for the whole wall of about 7 inches, which has been proved to be amply sufficient. The wood employed is fir, treated with refined linseed oil. Fir has the great advantage of cheapness, and is strong and elastic. It is somewhat light in tone at first, but darkens rapidly and takes a rich harmonious patina.

A châlet near Geneva, built in 1893 by Mr. Edmond Fatio (to whose kindness we are indebted for some of the plans and details used for this study), retains in its main features the silhouette of the

flat-roofed châlet, of which several specimens have been presented here (Fig. 15.) The preceding plate showed the composition of the wall, and this one gives a view of the entrance. The front faces the lake. The framework is visible, the system of protecting the construction is well applied, and the verandahs and galleries are ingeniously disposed. The decoration is sober, almost timid. The consoles are not as fully developed as they might have been, and their carvings are not as interesting as we had a right to expect in connection with a style that has furnished us with so many fine models of carved wood. The chimneys, too, far from adding to the picturesqueness of the house, are out of harmony with the general scheme of construction. However, the work, taken as a whole, is satisfactory; the proportions are good, and it is a thorough châlet, i. e., a house of wood.

In Fig. 16 we give a plan of the ground floor, and in Fig. 17 an inside view, taken from the hall, the latter showing to what good use wood can be put for internal decoration. The rooms communicate with each other by wide openings. The house is very suitable for a

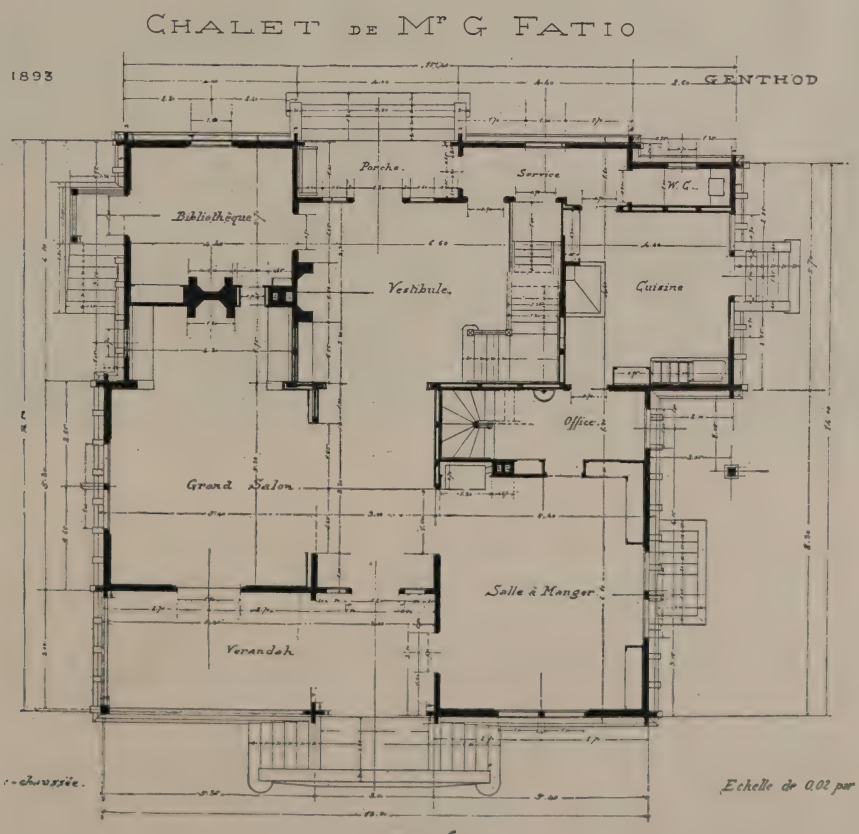


FIG. 16.

summer residence. The total cost of building such a châlet, including plumbing, heating arrangements, complete internal decoration in wainscoting, is 60,000 francs, or $12,000. The châlet measures 50 feet by 45 feet. The prices of the wood are as follows:

Outside walling of madriers, 3 inches thick, 13 francs per square meter; the large carved brackets, 15 francs each; the fine carved decorations, 2 francs per running meter; the large beams, carved in little arcades or otherwise, 3.25 francs per running meter.

The carpenters of the present day are exceedingly skillful, and turn out carved decorations of a very fine character. There is, therefore, no reason why the exterior of modern châlets should not be as ornate



FIG. 17.—HALL IN CHALET.

as that of old ones, unless it be the cost, and as to that it should be observed that 2 francs, or 3.25 francs, per running meter for the decoration of a house-front is not a very excessive price.

Another of the same architect's productions, situated at Rolle, on the bank of the Lake of Geneva (Fig. 18), presents a more picturesque arrangement. The decoration is more elaborate, the relief sharper; the consoles are of more ample proportions and they sustain a great outward extension of roof. The general aspect offers a certain variety, and does not present that symmetry of outline which architects are too prone to strive after. We have seen that wood

architecture in its best manifestations never hesitates to sacrifice symmetry to picturesqueness. The ingenious arrangement of the interior is also noteworthy. On the lateral front, shown in the photograph, the architect has retained the type of little windows, so charming in the old châlets. There is a group of four on the ground floor, protected by a penthouse. On the first story there are two which project and two in the plain wall. These eight small windows give light to a large hall two stories in height. Fig. 26 gives a view of it; but it should be mentioned that the photograph has been taken too close and fails to give an idea of the real size of the apartment, which is 9.80 meters long by 6.50 meters wide, with a height of



FIG. 18.—CHALET DE ROLLE.

5.90 meters. A staircase leads to a smoking gallery, which is as wide as the hall and 3.10 meters in length. The lighting, by means of little windows, is very successful. This is one of the difficult points in connection with châlet building. The delicious old models are very cramped in the matter of dimensions, and modern owners ask for big windows, giving an abundance of light.

The plan of this large châlet will be interesting (Fig. 19). As will be seen, the total dimensions are 21.75 meters of frontage by 11.85 of depth. The total cost of construction, including all the interior decoration in various kinds of wood, is 80,000 francs.

We reproduce also the plan of another châlet, which is in course of

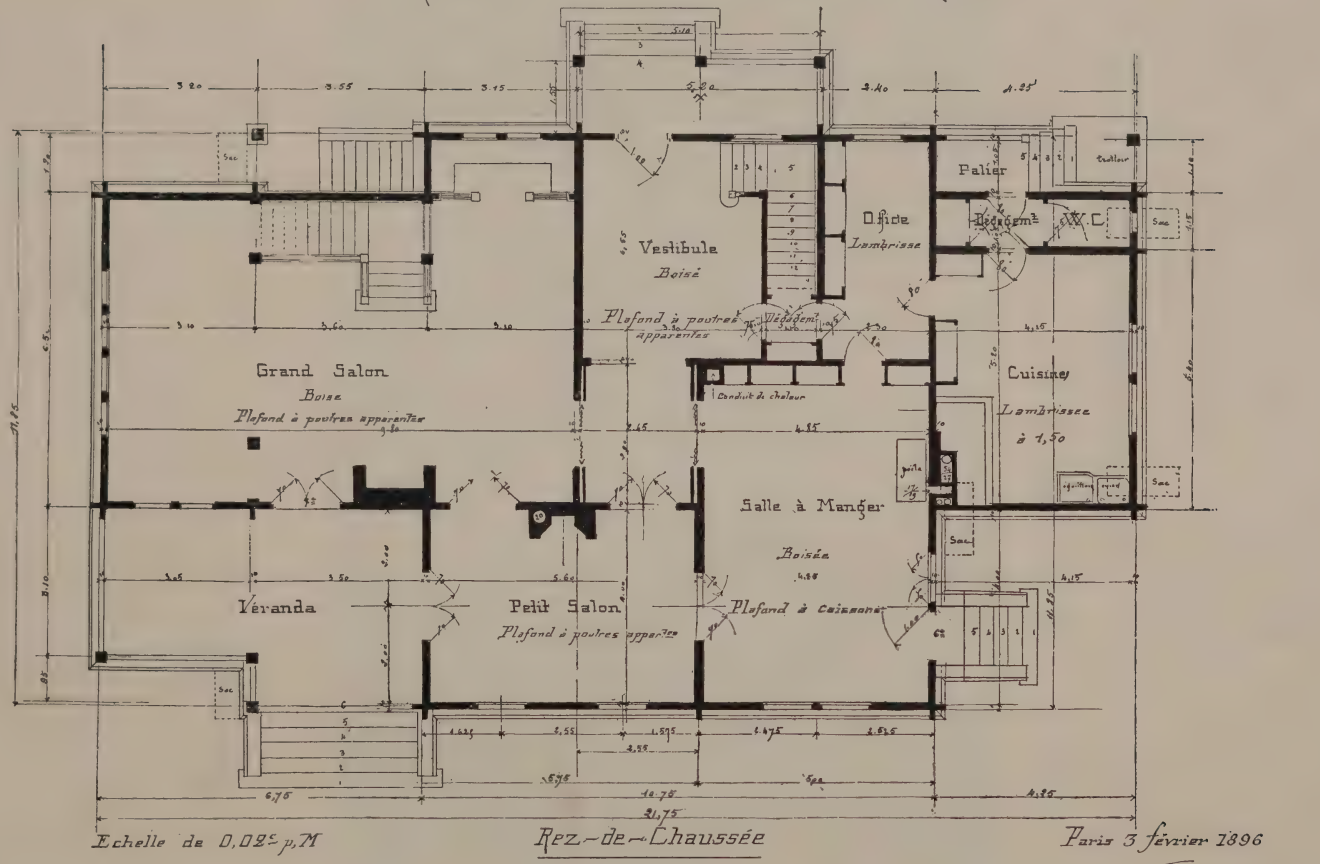

Propriété de Mr Kunkler à Rolle
Vestibule
Boisé
Plafond à poutres apparentes
Grand Salon
Boisé
Plafond à poutres apparentes
Office
Lambrissé
Palier
Bedroom
W.C.
Cuisine
Lambrissé à 1,50
Salle à Manger
Boisée
Plafond à Caissons
Véranda
Petit Salon
Plafond à poutres apparentes
Conduit de chaleur
Echelle de 0,02 p.M
Rez-de-Chaussée
Paris 3 février 1896

FIG. 19.

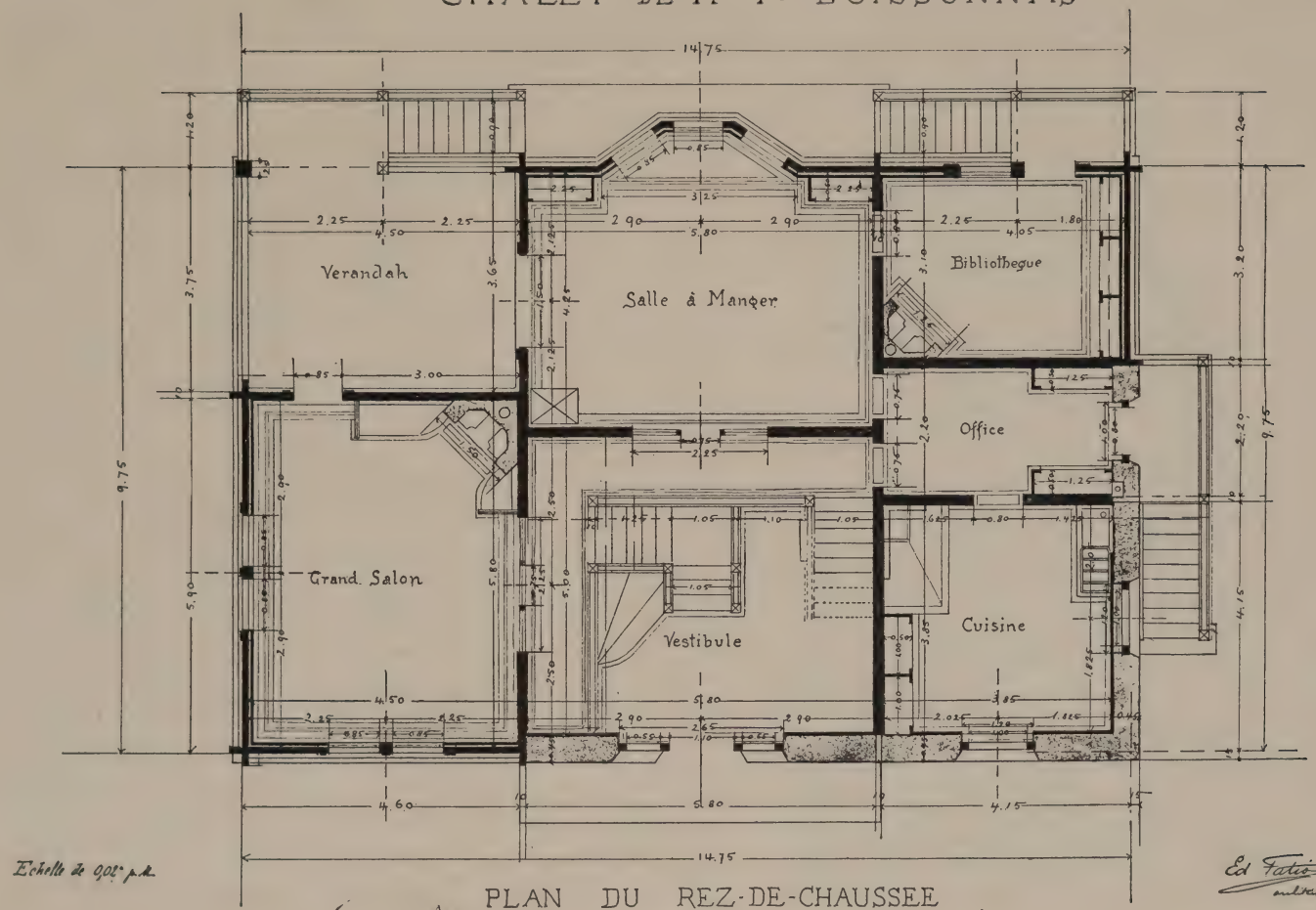

CHALET DE Mr Fs BOISSONNAS
Verandah
Salle à Manger
Bibliothegue
Office
Grand. Salon
Vestibule
Cuisine
Echelle de 0,01 p.M.
Ed Fatio
PLAN DU REZ-DE-CHAUSSEE

FIG. 20.



FIG. 21.—FACADE OF CHALET.

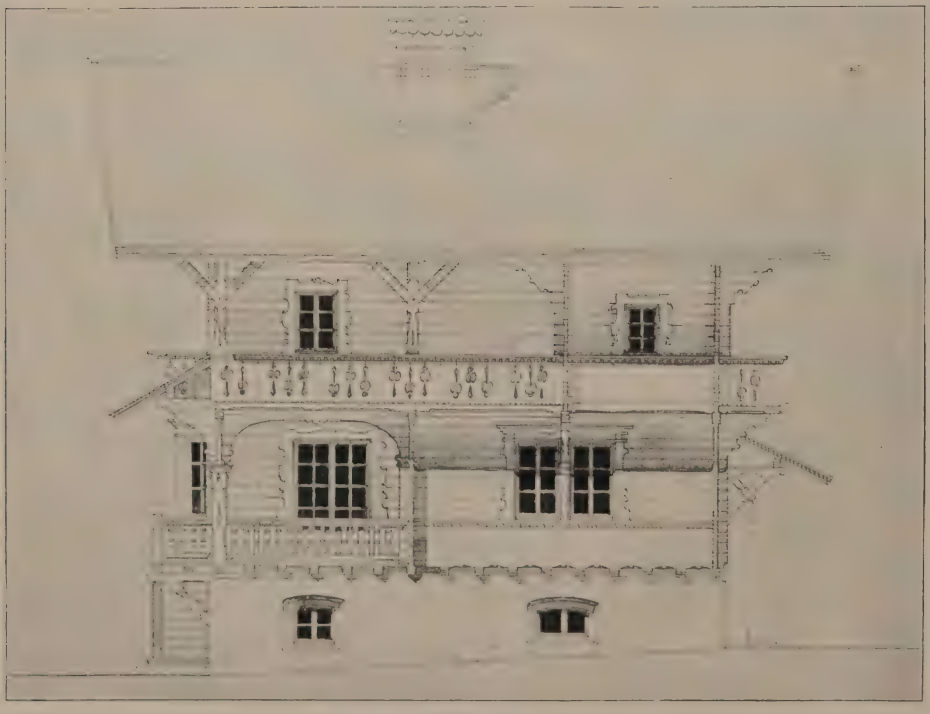
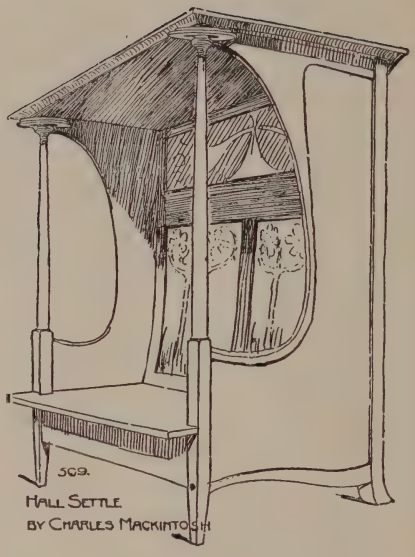


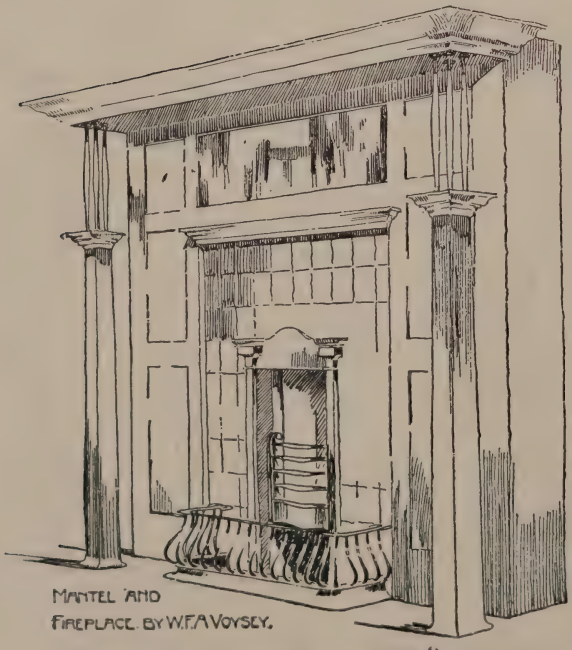
FIG. 21A.—SIDE ELEVATION.

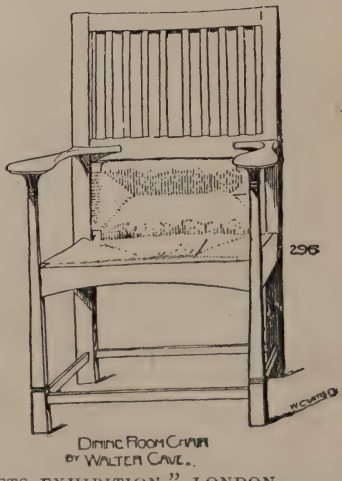
being done in wood architecture in Switzerland, where it had such a fruitful and splendid past. Differences in social life have necessitated the appropriation, by a new class, of models which formerly belonged to the farming and well-to-do peasant class. In the present day the rich middle-class build châlets for their summer residences. In spite of all the transformations necessary in old châlets to meet modern tastes and requirements, we think it results from this examination that it is, nevertheless, in the types furnished by the past that wood architecture must seek inspiration and guidance, and that an attentive study of the models here gathered together cannot fail to be truthful in teachings. Wood architecture, as manifested in Switzerland in the sixteenth, seventeenth and eighteenth centuries, has the incomparable merit of being a system which defies translation into another material without losing all its grace and beauty—a system perfect in cohesion and logic, and based entirely upon an exact understanding of the properties and qualities of the substance employed, namely, wood.

Jean Schopfer.









EXAMPLES OF FURNITURE IN THE "ARTS AND CRAFTS EXHIBITION," LONDON.

(From The Builder, London.)

PUBLIC LIBRARY

A DISCOVERY OF THE ENTASIS IN MEDIAEVAL ITALIAN ARCHITECTURE.*

I.

AMONG the architectural refinements of Greek antiquity there is no one feature as universally recognized and as widely known as that of the columnar "entasis"—the swelling or outward curving profile of the column. According to the Century Dictionary, "The entasis is designed both to counteract the optical illusion which would cause the profile of the shafts to appear curved inwards, if they were bounded by straight lines, and to give the effect of life and elasticity to the column in its function of supporting superimposed weight."

As distinct from the horizontal curves of Greek architecture, which are commonly supposed not to have been employed by the Roman builders, the entasis of the column is generally found in Roman constructions, and it frequently appears in the engaged columns used as wall decorations as well as in actual porticos.

In Renaissance architecture once more, to which the horizontal curves are supposed to be absolutely unknown, the columnar entasis is of well-known and constant occurrence. It is even employed by Palladio in wall pilasters as distinct from engaged columns, a use which is supposed not to have been made by the Romans and which has consequently somewhat astonished modern architects; the presumption being that so devoted an apostle of Roman art as Palladio was would not have acted without a Roman precedent (Figs. 15, 16).

In view of the wide use of the entasis in the Roman monuments and in Renaissance buildings of the fifteenth, sixteenth and seventeenth centuries, it is a significant and startling fact that the entasis of the Greek columns at Athens and of other original Greek architectural monuments was not observed by modern architects or modern archaeologists until the year 1810. Knowing as *we* do that Roman art is borrowed Greek in all its decorations and in all its refinements, it seems utterly incredible that Stuart and Revett, who began their survey of the Parthenon in 1753, should have overlooked this best known of all classic architectural refinements—utterly incredible that the followers and successors of Stuart and Revett down to 1810 should have failed to notice it. This is, however, the bare and simple fact.

* All photographs used in illustration of this article, excepting Figs. 1, 5, 15, 16, 17, were made by Mr. John W. McKecknie for the Brooklyn Institute Survey.

According to Penrose* the entasis of the Greek columns was first noticed by Cockerell in 1810. According to Mr. A. H. Middleton** 1814 was the date and Allason the original discoverer, who was then followed by Cockerell. It would appear that the first accurate measurements of the Greek entasis were carried out by Joseph Hofer as late as 1837 or 1838,*** and it is a matter of general information that the systematic and comprehensive knowledge of the Greek entasis dates from the measurements of Penrose made in 1845-46 and from his publication of 1851.*

For the purposes of our own publications the inferences are evident. The mere fact that mediaeval architectural refinements have been hitherto overlooked by modern investigators does not in the least imply that they do not exist.

As far as explanations of the modern oversight of the Greek entasis are concerned it should be noted that no attention was paid to the original Greek monuments until after 1750, about which time began the Greek Revival, headed by John Winckelmann. It is significant for the wholly recent date of interest in Greek art (as distinct from Roman) that as late as the opening of the nineteenth century the British Government, acting on the advice of an expert commission, refused to purchase the Elgin Marbles, and that they were secluded in London for fourteen years, without other recognition than that which was given them by the painter Haydon. During all this time they were supposed to be "poor Roman copy-work of the time of Hadrian."

If, then, we wish to establish a precedent for the modern oversight of the mediaeval entasis, it is easily obtained by reflecting that the incipient stages of modern interest in mediaeval art are seventy-five years later than the same stages of interest in Greek art. The revival of historic, literary and artistic interest in the Middle Ages began about 1820, or 1825, and before this date the mediaeval monuments had been utterly neglected and despised since the middle of the sixteenth century. Mediaeval style and taste were repudiated in Italy more than a century earlier.

When a cultivated Englishman of Charles the Second's time writes down his impressions of French cathedrals, two words are sufficient to express them—"only Gothic." This is what we find in Evelyn's Diary. The organ of refined English society at the opening of the eighteenth century quotes the Gothic cathedrals as well-recognized types of abnormal ugliness. This is what we find in Addison's Spectator. It is well-known that the re-discoverer of the Middle Ages was the German poet Goethe, and that his Essay on

* Principles of Athenian Architecture.
** Dictionary of Architecture, under "Entasis."
*** Wiener Bauzeitung, 1838.



FIG. 2.—VIEW LOOKING ACROSS THE NAVE OF THE PISA CATHEDRAL FROM AN AISLE OF THE NORTH TRANSEPT.

Showing the rear of the pier whose pilaster entasis is seen in Fig. 8, and ancient columns from Sicily, also having the entasis. For the leaning column on the right see text at p. 82.

the Strassburg Cathedral was the first modern proclamation of the beauties of mediaeval architecture (about 1773). But this same Goethe, who had time in Padua to inspect and buy editions of Palladio, did not visit the Arena Chapel (1786). Goethe, who left his diligence and made a detour on foot to inspect the Temple of Minerva at Assisi, never saw the Church of St. Francis (1786). This was the current attitude toward mediaeval art in the later eighteenth century, and Goethe himself, its first real apostle, did not rise to its comprehension in general until a later date, when he became the founder of the "Romantic School," of Germany, from which the Gothic Revival of 1820-25 must be dated for the rest of Europe.

If, then, the Greek Revival, dating from 1750, reached a recognition of the best known of all Greek refinements, the entasis, in 1810, we may more easily understand why the Mediaeval Revival, dating from 1825, is groping toward a recognition of the use of mediaeval architectural refinements in 1897.

II.

We come back once more, then, to the assertion that, in view of the well-known and widespread use of the entasis in Roman and Renaissance monuments, the oversight of the entasis in the original monuments of Greece, and during a time when they were being attentively studied, between 1753 and 1810, is a significant and a startling fact. One explanation is, no doubt, the one suggested by Mr. Penrose, viz., that the Greek entasis is more delicate and more easily overlooked than that found in Roman and Renaissance buildings. There may be another.

Just as modern men of a primitive culture have sharper senses of vision than the modern man of European civilization (the superior eyesight of the American Indian is a well-known instance), so it appears likely that the eyesight of the average man of modern civilization is inferior to that of the Greek, of the Roman, of the man of the Middle Ages, or of the Italian of the Renaissance. To the historian of painting no fact is so well known as the general decline in average color quality of the paintings of the seventeenth century as compared with those of the sixteenth century. This decline is again marked in the paintings of the eighteenth century as compared with those of the seventeenth century. The average paintings of the early nineteenth century are again inferior in color quality to those of the eighteenth century. The English neglect of Constable and the French neglect of Rousseau—men who had to die in order to become famous—are notorious instances of the want of color sense in the public and in the critics of the early nineteenth century. Goethe has remarked on the general want of strong color sense in modern

people of culture, and he suggests that the reason may lie in the weakness of their eyes.

It cannot be denied that there has been a general and continuous decline in the average color quality of pictures since the last quarter of the sixteenth century and down to the second quarter of the nineteenth century (since which time we have seen an improvement, due to the interest in Oriental color and in historic pictures). This decline must be due to a corresponding decline in color sense on the part of the public, of which the artists are a portion and to whose taste they must appeal for bread. Was there not a corresponding decline in sharpness of vision as regards the appreciation of form and outline? The architect is only a member of a community to whose taste he is subject, and whose general taste he reflects. It is a matter of general information that the architectural style of Michael Angelo (middle sixteenth century) is inferior to that of Bramante (late fifteenth and early sixteenth century), and that the style of Bernini (seventeenth century), is inferior to that of Michael Angelo.* Here again we find the same falling off, for periods as a whole, which is true of their greatest representatives, and here again the explanation must lie ultimately in the taste and eyesight of the public.



FIG. 3.—DETAIL OF FACADE, S. MICHELE, LUCCA. The engaged mediaeval columns have an entasis.

It would not be difficult to prove that the diffusion of printed books, the gradual specializing of occupations, the division of labor, and the ultimate triumph of machinery over hand-work have tended to

* Although, roughly speaking, Michael Angelo was contemporary with Bramante, his architectural work begins from twenty to thirty years after Bramante's death, and represents a much colder and more formal stage of Renaissance design—the first stage of the decadence.

cripple certain faculties in civilized man. The brain has been developed at the expense of the eye and of the hand. What could be more striking proof of this than the recent effort to retrieve this loss by artificial manual training in schools, just as the tests for color blindness which are now in vogue are a testimony at once to the perfection of modern science and to the impotence of the modern eye?

If, then, it should be true that the oversight of the Greek entasis between 1753 and 1810 was due to a general constitutional deadening of the animal faculties in favor of an overwrought nervous and mental activity, to which modern civilized man has been undoubtedly subject, it would not be a surprising fact.

Such considerations lead us to understand at one and the same time the modern oversight of mediaeval architectural refinements and the superior artistic organism of the human beings who once enjoyed and devised them.

III.

The use of a columnar entasis in Italian mediaeval buildings in phases which are the exact counterparts or equivalents of those found in classic antiquity is to my present knowledge and observation a rare occurrence. It does, however, occur in some presumably very well-known churches, and the use of an entasis in the profile of mediaeval piers and pilasters on the side facing the nave is widespread in Northern Europe, as well as in Italy, although up to date the fact has not been recognized. It is wholly improbable (and this will have a very important bearing on the purposes of the Italian horizontal curves discussed in our last Paper) that any sentiment but that of beauty for its own sake, as distinct from a purpose of optical correction, could have inspired it.

This makes it all the more important to mention that an entasis in other forms than columns and piers was employed in the Middle Ages and possibly for purposes of optical correction.

The following facts are mentioned by the same Mr. A. H. Middleton, whose very generous notice of my own results at Nîmes, in Egypt, and in Italy, appeared in the "Nineteenth Century" for March, 1897, and was republished in the "Scientific American" for April 24th. These facts are entered in an article on the "Entasis" contributed by Mr. Middleton to the "Dictionary of Architecture."*

> The mediaeval architects also occasionally used an entasis. The round towers, excepting those of late date in Suffolk, have an entasis (Builders' Journal, XVI., 260), and a diminution and entasis are common features in the towers of Essex and Middlesex. The tower of All Saints' Church, Colchester, has an entasis, and diminishes from 22 feet to 19 feet, with internal offsets. This expedient was also employed, sometimes to excess, in

* Issued by the Architectural Publication Society.



FIG. 4.—A PIER IN THE CATHEDRAL OF FIESOLE.
Showing the entasis in profile.

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spires and broaches, as may be seen in the spires to the west end of the cathedral at Lichfield. The spire of Gedling Church (Civil Engineers' Journal, VII., 47,105), about four miles from Nottingham, has an entasis which in its widest part is not less than two feet, and the spire at Newark, of about the same date, affords an instance of the curved line; but in most cases of mediaeval spires the effect was not produced by a continuous curve, but by distinct lines. The fragment at the Church of St. Mary Redcliff at Bristol may be cited as showing two distinct lines, even in so small a part of the work; where the required form is given in three lines, the junctions generally occur at one-third and two-thirds of the height. One of the spires at Stamford has an outline formed by only two lines and one angle in the height. A rule for regulating the entasis in a spire is described by T. Turner (Builders' Journal, 1848, VI., 375).

To the above facts cited by Mr. Middleton we may add one which was verbally communicated a few weeks ago by Mr. George L. Heins, viz., that the square tower of San Zenone at Verona has an entasis.

It is probable that the facts mentioned by Mr. Middleton for England will prove to have other counterparts in Italy, although spires are practically unknown there, and that the facts will hold for spires and towers in all parts of Europe. As the facts stand, however, they are sufficient to suggest that optical corrections, as well as optical illusions, were studied by the builders of the Middle Ages. This point may be regarded as corroborative of facts which have been quoted in my own Papers, for it will be difficult to assert that a period could have had no knowledge of optical illusions which was able to design an optical correction for an optical illusion. The effect of concavity in the straight lines of a spire, in so far as it exists, would be due to an optical illusion of divergence in lines which meet at an acute angle. As the eye moves away from the angle the lines appear to diverge in an increasing degree. As for an illusion causing an appearance of concavity in towers it may come under one of the explanations suggested by Mr. Penrose for columns. It is, however, certainly conceivable that an entasis in a square tower like that of San Zenone is simply due to a preference for the "life" of the curving line. It seems possible that all explanations of the entasis, up to date, have laid too much stress on the purpose of optical correction, and that this is especially true for spires and towers.

IV.

The "Century Dictionary" has been referred to at the opening of this article for the explanation of the entasis of Greek columns generally to be found in modern authorities, viz., that it is partly a correction of an "optical illusion which would cause the profile of the shafts to appear curved inwards if they were bounded by straight lines," and that is partly designed to give an effect of "life and elasticity" to the column. In other words, it is universally admitted



FIG. 5.—SAN MINIATO, FLORENCE.

Showing an entasis in the profile of the engaged half-columns, facing the piers.

BOSTON

that the columnar entasis is partly due to an aesthetic preference for the curve as against the straight line. Mr. Fergusson, for instance, notes that the want of an entasis "gives that rigidity and poverty to the column which is observable in modern examples." The following quotation from Mr. Penrose also shows the same admission of an aesthetic preference for the curve as distinct from a purpose of optical correction: "The above reasons for an appearance of contraction and weakness in the central parts of the shaft, as well as the real monotony of a perfectly straight line, seem sufficient to have led the Greek architects to the use of an entasis."

As to the causes which tend to make a column appear thinner at the centre, they are more rarely discussed by the authorities, and the subject is treated by optical experts as one of some difficulty.

Mr. Penrose admits that the causes are not wholly clear, and considers his own explanation as tentative. It is, briefly stated, that the eye dwells longer at the base and top of the column than it does at the centre, and that the centre consequently appears weaker and thinner. Thiersch* rejects this explanation and gives an elaborate series of diagrams to show that the fundamental cause of the optical appearance of inward deflection lies in the diminution of the classic column. This diminution tends to exaggerate the effects of natural perspective (Fig. 1). Therefore the column appears taller than it really is. Therefore the top of the column appears wider than it really is. Therefore the eye in moving up the column moves from the foot, where the actual width is visible, in lines which tend to diverge outward from the upper actual width of the column. Hence an appearance of concavity, hence the optical correction.

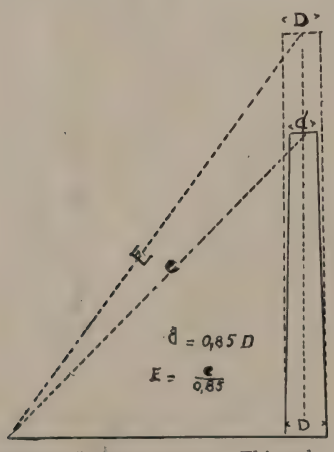


FIG. I. Diagram from Thiersch, showing the apparent increase in height and consequently of upper diameter of a shaft, as due to the diminution.

Thiersch remarks in support of his contention that the cylindrical shafts and columns of mediaeval churches which have no diminution do not appear concave at the centre.

It appears that the effects of light which Mr. Penrose considers in his analysis of the appearance of a Greek portico, as tending to exaggerate dimensions at the foot and top of the column, do not come in play in a church interior. It may also be that the optical explanation of Thiersch has most value for points of view near the column,

*Optische Täuschungen auf dem Gebiete der Architectur, in the Zeitschrift für Bauwesen, 1873, p. 10.



FIG. 6.—NAVE OF THE PISA CATHEDRAL, FACING THE ENTRANCE.

Photographed from the top of the High Altar, showing an entasis in the profile of the pilasters facing the piers at the transept.

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where the eye has to travel farthest in taking in its dimensions and where the diminution of the shaft gives greatest illusion of added height and consequently of increased upper width. It may be that the explanation of Penrose has greater value for points of view farther removed from the shaft, where the angle of vision more nearly includes the whole shaft. Finally it may be that both these experts give relatively too little consideration to the aesthetic feeling of the Greek architects—to that sentiment of beauty which is conceded to have had a share in the creation of the entasis and which they both concede to have a share in the satisfaction which the eye obtains from its results. It is at this point that our own observations of the hitherto neglected entasis in Italian mediaeval piers and pilasters begin to come in play.

V.

In the early Italian basilicas and in those numerous Italian Romanesque churches which continue, like the Cathedral of Pisa, to employ the columnar supports of the basilica, the entasis frequently appears, because the columns used were taken generally from Roman structures. These are not quotable cases of a mediaeval use of the entasis, but they offer a palpable and easy explanation of the source and origin of the mediaeval entasis.

In the matter of Italian mediaeval horizontal curves we have to contend with an unsolved problem, viz.,how far the horizontal curves were used in late Roman buildings which have been destroyed, and in early Byzantine buildings which have been destroyed or which have not been examined for this appearance, but in the case of a mediaeval entasis we meet the obvious solution that the Italian mediaeval builders were surrounded by thousands of Roman examples, which were used again in their own constructions. Notice, for instance, in Fig. 2 of the Pisa Cathedral, the entasis of the columns on the left. The plumb-line hanging from the gallery enables us to recognize its very pronounced character. The entasis is also observable in all the columns of Figs. 10 and 12. If the mediaeval builders had not noticed these examples they would have been blinder than Stuart and Revett. If they had not copied them they would have been more inartistic than Bernini.

It is often difficult to distinguish mediaeval columns from the more numerous borrowed Roman ones. What might be revealed by minute investigations as to the number of really mediaeval columns (as distinct from piers or pilasters) which exhibit an entasis, it is impossible to say, but it is highly probable that the number of quotable cases is much larger than the list here given, for our survey in Italy devoted attention mainly to the entasis of the piers.



FIG. 7.—NAVE OF THE PISA CATHEDRAL AND THE NORTH GALLERY.

Showing the entasis in the profiles of the pilasters at the transept (also showing the bend in elevation of the north gallery).

The following cases of the columnar entasis are all distinctly mediaeval. It holds of the engaged columns in the main portal of S. Pietro at Toscanella and of the columns in the main portal of S. Giacomo at Florence, but these cases are so crude and corrupt (and the columns are so small) as to have little interest or significance. A much more important case is seen in Fig. 3, that of the engaged columns on the walls of S. Michele at Lucca (whose horizontal curves were specified and illustrated in our last Paper). Most of these columns have a very delicate entasis and they are undoubtedly mediaeval. This is attested by my own observation of the masonry; also by the consideration that the proportions are too slender for classic columns, as appears from the photograph.

Still more interesting examples are, however, those found in the profiles of piers in the Cathedral of Fiesole (Fig. 4) and in S. Miniato at Florence (Fig. 5)—more interesting, because the forms showing the entasis have the characteristics of the mediaeval pier and still have an obvious analogy with classic examples of the engaged column and of the ancient columnar form in general. The closeness of this relation is also suggested by the capitals, which are mediaeval Corinthian. The photograph of the entasis at Fiesole (Fig. 4) (repeated from the first article of this series) is a dull picture taken near dusk, and not very satisfactory. In the small dimensions of the reproduction it will require rather close attention to detect the curve, which is shown by the half-column seen in profile. It will best appear by sighting down the page with its bottom held near the eye. Our finest illustration of the mediaeval entasis is found in Fig. 5. This photograph was not made by our survey, but is reproduced from a picture loaned the "Architectural Record" by Mr. A. A. Hopkins, of the "Scientific American." The phenomenon appears in this picture accidentally. An illness of Mr. McKecknie in Florence made it impossible for our survey to take a photograph in S. Miniato. The facts were, however, noted on the spot by myself and my nephew, Mr. Nelson Goodyear.

The importance of the examples of the mediaeval entasis so far quoted is far-reaching. The use of this refinement in the given buildings is undeniable, and it is a refinement which has not, up to date, been credited to the mediaeval pier. In so far, then, we find a corroboration for the discovery of horizontal curves previously announced. The existence of either refinement strengthens the presumption in favor of the other. Moreover, this entasis is so unmistakably classic in origin that the contention in favor of considering the mediaeval horizontal curves as a classic survival is materially strengthened.



FIG. 8.—PISA CATHEDRAL NAVE.

Showing an entasis in the profile of the pilaster at the transept. A plumb-line suspended from the gallery shows a forward curve of 3¼ inches deflection.

VI.

The peculiar use of the entasis at Fiesole and in S. Miniato is outside those explanations bearing on a purpose of optical correction which have thus far figured so conspicuously in the explanation of the classic columnar entasis. It is for this reason that in a preceding paragraph attention has been called to the supposed causes of an illusion to be corrected. No suggestions are conceivable here excepting those of an aesthetic character. If the entasis is beautiful when used by the Greeks it must be beautiful when used by the Middle Ages, and no optical expert has yet appeared to discover that there is an optical appearance of concavity in the piers and clerestory walls of a church which needs correction by a contrary convexity. If, then, aesthetic considerations were paramount in these certain cases, may they not have been paramount in the use of the mediaeval horizontal curves? The tendency to stress the theory of a purpose of optical correction for the horizontal curves of antiquity which is observable in Penrose and his followers, undoubtedly makes a belief in the purposed construction of mediaeval horizontal curves a difficult one, but if we assume in both cases that the horizontal curves were more a matter of feeling and of art than they were of optical science, this difficulty disappears. This assumption for mediaeval curves is certainly supported by the existence of a mediaeval entasis which cannot be ascribed to a purpose of correction.

But the most important phase of this topic has not yet been touched upon. It may be urged that the instances at Lucca, Fiesole and Florence are isolated cases—the results of local imitation—which have no wide bearing on the art of the Middle Ages as a whole, but there are others of which this cannot be said.

The instances shown at Fiesole and in S. Miniato merge into other instances of a vertical curve convex to the nave, which is a widespread phenomenon in the piers and pilasters of Romanesque and Gothic churches. The Pisa Cathedral offers a beautiful example of this entasis, and although the pilasters here in question depart widely from the forms of classic antiquity, the use of the curve corresponds exactly to that found in the examples already illustrated, in which these forms are more closely copied, and is clearly related to them. The use of the word entasis as applied to these curving pilasters is strictly within the interpretation and definition of the term as found in the Dictionary of Architecture, and in the article by Mr. Middleton from which quotation has been made. In this article the term is used to include all forms of the Greek curve—horizontal as well as vertical. The word entasis is derived from



FIG. 9.—PISA CATHEDRAL NAVE.

View looking from the south transept gallery into the north transept gallery; showing the masonry of the arch spanning the nave and of its pilaster.

ἐντείνω and means a stretching or distention, hence any swelling or curving line.

Fig. 6 is a photograph taken from the top of the High Altar of the Pisa Cathedral. (From the standpoint of the photographer it is an interesting case of a picture looking through an open door, against the light, and without a halation. The path leading to the Baptistery and the Baptistery door are seen in the distance. Mr. McKecknie obtained the effect by opening the door after a long exposure was nearly completed and only a few seconds before its termination.) This photograph exhibits the graceful vertical curve of one pair of the pilasters of the great arches spanning the nave. The curves are convex to the nave, the pilasters lean out gradually and delicately from their bases, then straighten back to the perpendicular. Thus there is a delicate suggestion of a horseshoe bend toward the meeting of the pilasters with the lines of the arch. This beautiful curve is again varied by the cutting of the voussoirs, which give a higher pitch and a more pointed form to the upper side of the arch. This treatment of the arch in non-concentric curves is also found in the round arches of the Pisa Cathedral; see Fig. 11.

The general character of these curves is well shown by Fig. 7. This picture also shows the gallery bend in elevation, of which another view appeared in the last issue (Vol. VI., No. 4, Fig. 14). The surveys of this bend and of its opposite counterpart are given in Vol. VI., No. 3.

Fig. 8 exhibits the pilaster curve as repeated from the cut published with the preliminary general announcements of Vol. VI., No. 1. A plumb-line is here seen suspended by a stick held on the edge of the gallery above, in such a way that its lower end defines the edge of the pilaster near the base. The forward curve is thus measured at 3¼ inches. It is to be observed that the pilaster does not bend back of the perpendicular, and this will appear by placing a straight-edge on the plumb-line so as to continue its direction as far as the capital.* Hence, if there had been a thrust of the lower aisle vaulting there would be a fracture and displacement in the masonry joints above the capitals of over three inches. It is fortunate that the marble masonry of this part of the Pisa Cathedral shows the closest fitting and the finest jointing which the Middle Age can boast. In order that the delicacy and close-fitting joints of the original and unrepaired masonry may appear, the following photographs are appended. They relate mainly to one pilaster, but the facts all hold for its fellow. Fig. 9 is a photograph showing the

* The right pilaster does have a delicate return curve back of the perpendicular, but the possibility of an outward thrust from the arch above seems wholly barred by the consideration that this arch thrusts against transverse walls in the galleries, which unite with the exterior transept wall. For this construction see the plan of the galleries, Fig. 13. The doors, whose openings appear in the plan, are of no great height.



FIG. 10.—INNER NORTH AISLE, PISA CATHEDRAL, LOOKING TOWARD THE TRANSEPT.

Showing the vaulting. For construction above at the piers compare the gallery plan, Fig. 13.

face of the pilaster and the construction which surrounds it. The sharp and well defined edge of the arch masonry and its unfractured continuous line are very clearly shown. Fig. 2 shows a rear view of the pier of which this pilaster is the facing. (The leaning column on the right in Fig. 2, shown in contrast with the plumb-line, leans by constructive setting and leans from a slant in the joint seen above the base. The survey has a photograph of this column in large detail from the opposite side, which shows the column bending at the joint. The columns of ancient temple porticos were leaned intentionally for reasons variously explained. See, for instance, Boutmy and Penrose. No conclusions can be drawn from this ancient example as to the intentional asymmetry of leaning columns in mediaeval work.) Fig. 10 shows the aisle vaulting nearest the pier in question. The pier in Fig. 10 is on the right and is seen in the distance. At this point it will be noticed that the vaulting rests on a transverse wall and a lower arch of black and white marble voussoirs. Fig. 11 shows the adjacent aisle vaulting in a view facing in the opposite direction towards the entrance and illustrates the character of these transverse arches. A better view of the construction of these transverse arches below the aisle vaulting is offered by Fig. 12, which shows the construction of both aisle arches in one view. This view looks out of the south transept into the nave and relates to the pier and pilaster opposite to the one which has been illustrated in detail. It is very important to observe that all these photographs represent the original marble masonry of the arch construction in its careful workmanship and fine preservation. In the transepts the Renaissance stucco decoration of stripes imitating the colors of the marble begins above the line of arches, but it does not include the masonry of the arches. (In Fig. 12 the stucco begins at the first white stripe above the arches.) In the nave the stucco stripe decoration begins above the gallery arches, but the stucco does not extend to the pilasters which have been described. These explanations bear on the value of the photographs as showing the character of the joints and of the masonry construction. The delicacy and refinement of taste shown in the entasis of the pilasters are equally apparent in these details, which verify its constructive existence.

Fig. 13, a plan of the Pisa Cathedral galleries, shows the reinforcement of the piers at the level of the galleries by walls, which connect these piers with the walls of the transept.

Some additional facts are brought out by these pictures of a class considered under the head of constructive asymmetry (Vol. VI., No. 3), and it will be wise not to omit a mention of them here. It is the peculiar distinction of the Pisa Cathedral to combine a larger number of refinements than any other building in Italy and under con-



FIG. II.—EXTERIOR NORTH AISLE OF THE PISA CATHEDRAL, LOOKING TOWARD THE ENTRANCE.

Showing the masonry of the arches at the transept.

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ditions of such obviously careful arrangement when the masonry is examined in detail, that much light is thrown on the more isolated phenomena of many other churches. St. Mark's at Venice offers an equal amount of subtlety in its details, but under such conditions of ruder workmanship in some points, and of infinite variety in others, that it is difficult to draw the line there between artistic indifference to symmetry and the intentional avoidance of it. It would be difficult to prove, for instance, that the irregularities of casing in St. Mark's are anything more than the usual and natural results of artistic hand-work, such as appear in old lace and Oriental rugs, but the carefully contrived irregularities of the Pisan masonry reveal themselves unmistakably to a careful observer. If there were any doubt as to the definitely purposed avoidance of symmetry in the alternations of white and black marble which are shown by the arches of Figs. 11 and 12, and the horizontal stripes of Fig. 14, this doubt must certainly disappear when the piers are considered whose pilaster entasis has just been illustrated. Is it an accident that the whole right pilaster of Fig. 6 is of black marble and the whole left pilaster of white marble? Is it an accident that the whole main right pier faced by the black pilaster is of white marble (see Fig. 2)? Is it an accident that the whole main left pier faced by the white pilaster is of black marble (see Fig. 2 and Fig. 6)? Is it an accident that the whole rear pilaster facing the rear of the white pier is of black marble (see Fig. 2)? Is it an accident that the whole rear pilaster of the black pier is of white marble (see Fig. 12, compare Fig. 6)? After such a convincing proof we move with confidence to a study of the variations in masonry color, which are illustrated by the arches and stripings of Fig. 14. Such facts may be apparently foreign to those regarding the vertical curves, but they are not so in reality. Both classes of facts contemplate the avoidance of monotony—in one case the monotony of the straight line, in the other case, the monotony of parallelism in color.

In Fig. 6 we notice the capital of the pilaster on the right as being about two feet lower than the corresponding capital. This irregularity is especially to be remarked in Fig. 7, where the same capital, now seen on the left, should, according to perspective effect, be higher than the one opposite, but it is still seen as dropping below it. The mystification of the eye resulting from such asymmetry is much greater in the building than is suggested by the photographs, but one still feels, in glancing at No. 6, that the standpoint of the camera is much farther to the left, judging from the capitals, than it appears to be when the distances of the piers in the foreground from the edge of the picture are considered. It then turns out that we are not far from the centre of the church, in spite of the depression of the right pilaster capital.



FIG. 12.—PISA CATHEDRAL, LOOKING TOWARD THE NAVE FROM THE SOUTH TRANSEPT.

The impression that the photograph is taken farther to the left of the centre than is the case, is enhanced by several facts. The south gallery cornice (left in Fig. 6) is concave in plan, the north gallery cornice (right in Fig. 6) is convex in plan (see Fig. 13). The south gallery, therefore, is unduly foreshortened in the photograph, and the north gallery is less foreshortened than it would otherwise appear. This also gives an appearance of a picture left of the centre, which is again stressed by an inequality in the heights of the gallery cornices; the north gallery being eight inches lower than its fellow, at the transept. We have here another series of the expedients for producing an optical confusion as to the point of sight, by a series of varying effects from any one given standpoint, which have been described in an earlier article.

In Fig. 10 we see the plinths of the aisle columns whose arrangement in an unbroken curve has mention specified by figures in the preceding issue (p. 502) and which is represented by survey in Vol. VI., No. 3, Fig. 6. The complete curve could not well be shown in the picture, as it was not possible to place the camera so as to include the bases near the entrance.

In Fig. 12 we see some of the transept columns mentioned in Vol. VI., No. 3, p. 387, as averaging two and a half feet higher than the companion line, for reasons there explained. In Fig. 14 both these lines of transept columns appear in the distance.

In Fig. 11, finally, we have an illustration of the inevitable irregularities due to the use of heterogeneous materials, as shown in the varying heights of the line of capitals, which are simply due to the accidental variations in height of the ancient columns, which were brought from Sicily. (On these points compare Vol. VI., No. 3, p. 387.)

VII.

In these last paragraphs we have abandoned the treatment of the entasis in mediaeval piers in order not to omit new illustrations or corroborations offered by these pictures of points previously dwelt upon; all bearing on the general fact that subtleties of construction were systematically practiced by the Italo-Byzantine builders. Additional cases of the mediaeval entasis will be described in a following Paper. Meantime its general character may be further illustrated by a well-known Renaissance theatre, the Teatro Olimpico at Vicenza (Figs. 15, 16).

The Teatro Olimpico is a design by Palladio, constructed after his death. The stage scenery is a stationary construction of timber and stucco. Its central arch (Fig. 15) shows Palladio's use of the entasis in pilasters, a use which in this instance gives exactly the gen-

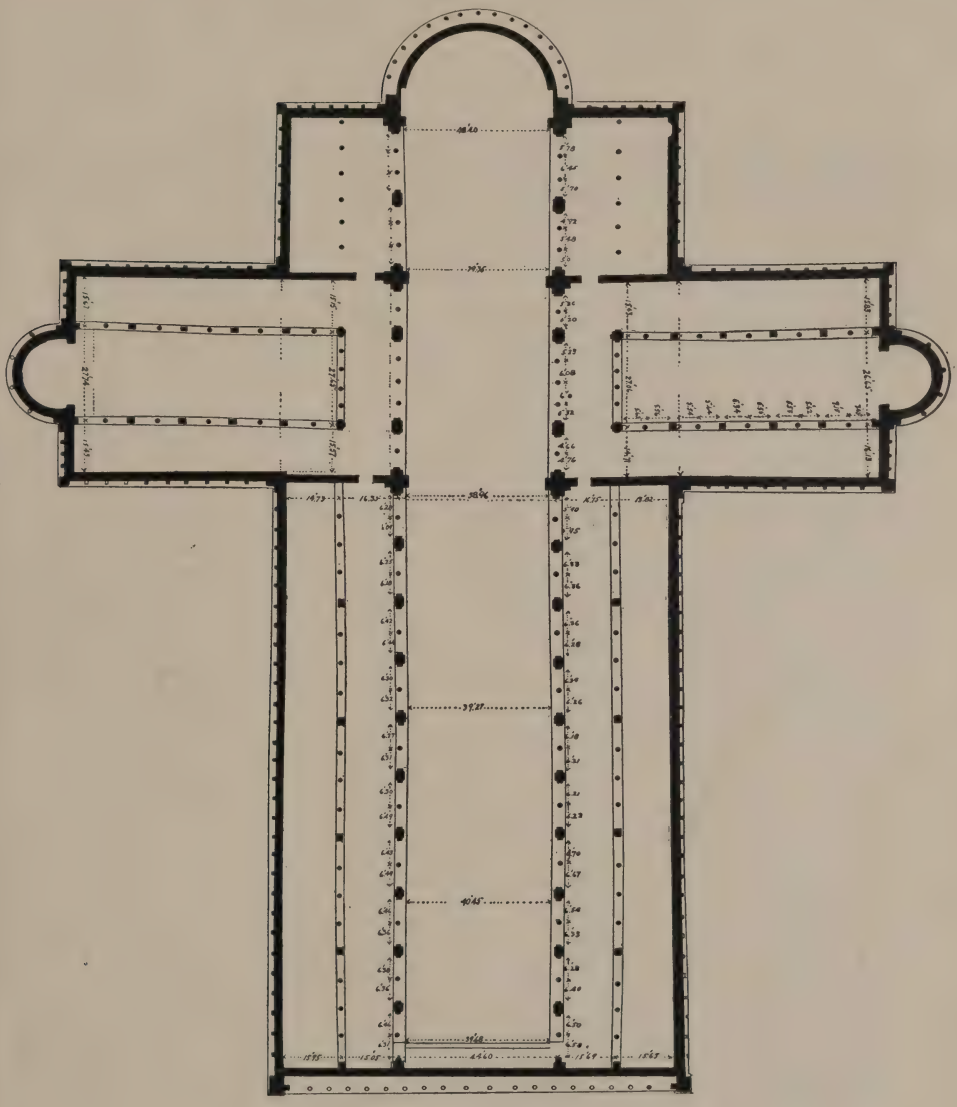


FIG. 13.—PLAN OF THE GALLERIES, PISA CATHEDRAL.

This plan shows the reinforcement of the transept piers and their connection with the transept walls. It also shows the curves in plan of the galleries. Drawn and surveyed by Mr. John W. McKecknie.

eral results of the backward bend of the pilaster into the curve of the arch which appears in S. Miniato at Florence (Fig. 5) and in many other mediaeval piers. The same bend appears in S. Stefano, a Renaissance church of Vicenza, as a result of the use of the entasis in pilasters. And the Gothic cathedral of Vicenza offers a closely analagous and impregnable case of the corresponding mediaeval entasis. This is the church mentioned in our first article as showing an entasis similar to that of Fig. 5, in half-columns which

face chapel walls, instead of piers. These walls are solid, without even the break of a door-way, and are about twenty feet in depth.

It has been observed in the opening of this Paper that Palladio's use of the entasis in pilasters is supposed by modern architects to be without a Roman precedent. The accompanying photograph from Baalbek (Fig. 17) shows, however, that the entasis was used in pilasters by the Roman architects of the second century of our era. I noticed this entasis at Baalbek in 1869, since which time the photograph now published has been in my possession. It is well known that many and important ruins of the city of Rome have disappeared since the sixteenth century. Two suppositions are therefore possible—either that Palladio did independently what the Roman art had done already or that he was acquainted with Roman examples in Italy, similar to that at Baalbek, which have since disappeared.

In either case it is probable that we have at Baalbek an example of a classic entasis which cannot be explained by theories of optical correction, and which must be due to aesthetic considerations. It is true that our instance is of corrupt style, but it is none the less important historically. None of the explanations of an optical illusion causing an apparent concavity of lines, to be corrected by an outward curve, will apply to such a case. The habit of considering the entasis of the Roman and Renaissance engaged columns as a wholly imitative feature, due to a cause existing in porticos and not existing in the engaged columns themselves, may receive some shock from this example. As long as aesthetic considerations are allowed to have some share in the conception of the Greek entasis (also generally quoted for Egyptian obelisks) it would appear that they must have had a still more distinct influence in the engaged columns and pilasters of Palladio and of the Romans. Certain it is that the Palladian palaces of Vicenza are, of all Renaissance buildings, those which strike the student of optical refinement as having an effect of optical mystification analogous to that found in certain mediaeval buildings. Is it not possible that this is due to Palladio's universal and emphatic use of the entasis—his use of the curving line?

VIII.

The point to be kept in view, however, is that as a matter of fact there are two sixteenth century Renaissance examples at Vicenza of a peculiar bend of the piers supporting an arch, and that this bend is a counterpart and continuation of the mediaeval entasis of the pier.

This leads me to say that in the composition of this article I have been influenced to some extent by the very important letter below



FIG. 14.—PISA CATHEDRAL, LOOKING FROM THE NORTH TOWARD THE SOUTH TRANSEPT.
Showing the systematically varied use of colored marble masonry in arches and stripings.

appended, and originally published in the "Evening Post" of May 3, which Professor Charles Eliot Norton was good enough to write me on the score of the discoveries which have been published in the "Architectural Record."

Dear Mr. Goodyear: I am much obliged to you for sending to me a copy of the last number of the "Architectural Record." Your article in it is of great interest, and, in continuation of your former paper, it brings together a series of facts which cannot but change our conclusions in many respects in regard to the principles and methods of mediaeval building. You have opened a vast field for discussion, and you have provided a mass of material so exact and so well selected as to furnish a solid basis for the work of future inquirers.

But it seems to me that one result of your investigations is that much wider investigation must now be undertaken. Your work, while it solves many questions, has but opened many others. One of the most important, certainly one which it is very desirable to determine in order that we may understand properly the principles of mediaeval building, is, whether the builders of the churches which show these remarkable designed irregularities erected them on a basis of well-recognized principle derived from authentic tradition, or whether in their construction they were using simply empirical methods handed down from generation to generation without intelligent understanding of their real significance.

If their work was based on a tradition from ancient times, it is a surprising fact that we have no literary record of the principles by which they were guided, no reference, so far as I am aware, in any work later that Vitruvius indicating that the architects possessed a body of traditional principles by which the character of their work was determined. (And when was the tradition lost? How did the precious knowledge vanish from the minds of men?)

I am much obliged to you for bringing to my attention Mr. Middleton's article in the "Nineteenth Century"; it is a just but hardly a sufficient recognition of the value of your work, and it is of service as calling attention to the fact that there is now need of much more elaborate examination and careful measurement of the best Gothic structures in England, as well as on the Continent, than they have heretofore received.

I hope that it is your intention to gather up your own various articles upon the matter into a volume. It is not easy always to study a subject which is to be looked up in various numbers of various magazines. I hope also that your interest in the subject is such that you will carry on your investigations in other regions than Italy, for there is no one who understands so well as you the various points which are to be regarded, and the risks of overlooking some of the matters which require closest attention. Indeed, one of the most instructive general results of your investigations is the conclusion which one is forced to draw in respect to the fallibility of human perceptions, and the carelessness of our common observations of the objects which present themselves to our sight.

C. E. Norton.

Prof. William H. Goodyear.

Two questions are raised by this letter which require consideration. How did the use of mediaeval optical refinements come to disappear and why have we no record of them?

I suggest, on the first head, that they did not wholly or suddenly



FIG. 15.—PORTION OF THE STAGE SETTING, TEATRO OLIMPICO, VICENZA.
Showing a horse-shoe bend in the profile of arch and pier, as result of Palladio's use of the entasis in pilasters. Compare Fig. 16.

disappear with the close of the Middle Ages. The horizontal curves are found in the parapets of the Certosa at Pavia which is early (fifteenth century) Renaissance. The vertical curves appear in the Teatro Olimpico and in S. Stefano at Vicenza in a similar form to that which we find in the Gothic cathedral of Vicenza. It is well known that perspective illusions were practiced by Bernini (Scala Regia) and by Borromini (Palazzo Spada). In fact, up to date such illusions have been only recognized as occurring in the late Renaissance. The nave of St. Peter's narrows in nine feet four inches between the entrance and the transept. This is quite possibly due to some special cause connected with the lengthening of the nave by Carlo Maderna, but it is not wholly impossible that an optical trick of the Bernini style is in question here. There is no doubt that a very considerable increase in perspective is obtained by this narrowing in of the nave at the third pier, and there is no doubt that this element of effect in increase of magnitude is universally overlooked. The deflected ground-plans of the Middle Age are also paralleled in St. Peter's, whose nave axis is deflected about a foot from that of the choir. One is tempted to ask whether there have not been Masonic secrets which the Free Masons have neglected since they ceased to be masons. It may be that the secrecy of some of the Masonic guilds which preceded and developed into the modern secret society of the Free Masons may answer one of the questions which Professor Norton has raised, as to the absence of written mention of the mediaeval refinements.

As to constructive asymmetry in the Renaissance, there is a suggestive passage in a recent German journal, apropos of the opening to the public of the Appartimento Borgia of the Vatican. I owe to the politeness of Mr. Edward R. Smith, curator of the Avery Library, my knowledge of this extract. The original German will be found in the Kunst-Chronik for May 15th, 1897.

> Was it intention or was it necessity that none of the walls are parallel in any of the rooms of the Palace of Nicholas V. or of the Torre Borgia?.... All the apartments have the form of an irregular trapezoid. There are no right angles at the corners of the rooms. Consequently the division of the spaces of the vaultings [and their frescos] and also of the walls, could not be managed without a certain hap-hazard [or arbitrary] appearance. Were the picturesque results reached consciously or unconsciously, by the abandonment of rules which no modern architect fails to consider? At all events the Appartimento Borgia offers in this line also an abundance of material for thought and for study, and the influence which the arrangement and decoration of these magnificent rooms, now once more thrown open to the public, are destined to exercise on the palace architecture of modern times cannot be estimated.

Similar facts to those quoted may be noted in the Stanze of Raphael, and they are especially apparent in a more oblique setting and align-



FIG. 16.—PORTION OF THE STAGE SETTING, TEATRO OLIMPICO, VICENZA.
Showing Palladio's use of the entasis in all columns and pilasters. Compare Fig. 15.

ment of the pavement mosaic patterns than the irregularity of the walls would seem to call for. The given rooms are a construction of Bramante, just succeeding in time to those of the Appartimento Borgia. It is quite certain that one superiority of the early Renaissance architecture to the more formal and frigid later Renaissance style lies in its off-hand spontaneity and acceptance of natural irregularity. Possibly it also shows an occasional purposed avoidance of symmetry. There are very strong curves in plan in the loggie of the Vatican built by Bramante, which face the piazza. They are not due to movement of masonry, as they reappear in the inner wall of the third story loggia. They may be due to carelessness, but it has not been usual to charge Bramante with this fault. Moreover, the inner wall curves, and outer cornice curves, are parallel.

Thus the survivals just quoted, and others which may be brought to light, may illustrate a farther gradual and natural dying out of the mediaeval refinements, which is already a very marked feature of the North Italian Gothic. Their ultimate entire disappearance would not be a startling fact, in view of the tendencies to artistic blindness in our own age which the failure to notice the Greek entasis appears to specify and illustrate.

If the artistic effects obtained in many mediaeval buildings were due to a highly cultivated artistic sense, then the gradual dying out of this artistic sense, which seems to be a conceded result of nineteenth century progress, would explain the disappearance of architectural refinements. If empirical observation of optical effect was one source of these refinements, the weakening of the modern eye will be one explanation as to why these effects are no longer studied. If traditional continuation of ancient classic methods was one source of the refinements, the gradual weakening of classic tradition through the later Middle Age will also explain their disappearance.

As to the absence of written records, which Professor Norton mentions, it is my impression that mediaeval writers did not indulge in architectural disquisitions or treatises on building. In so far as they have failed to give us systematic information on other points, it is not surprising that they should also have neglected this one. It appears in our own time that it is already growing difficult to write a connected history of the evolution of the steam engine, owing to the disappearance of important early plans. Is it not a generai rule that a vigorous and vital art does not tend to lay stress on literary record or literary elucidation? It would appear that the Greek works on the theory of architecture were later than the creation of the greatest monuments. In spite of the disappearance of these classic records, it is well known that many such existed, and that both optical corrections and optical illusions were considered by them. The preservation of Vitruvius was a lucky chance, and without it, it ap-



FIG. 17.—THE ENTASIS IN ROMAN PILASTERS AT BAALBEK, SYRIA.
The date is second century of our era.

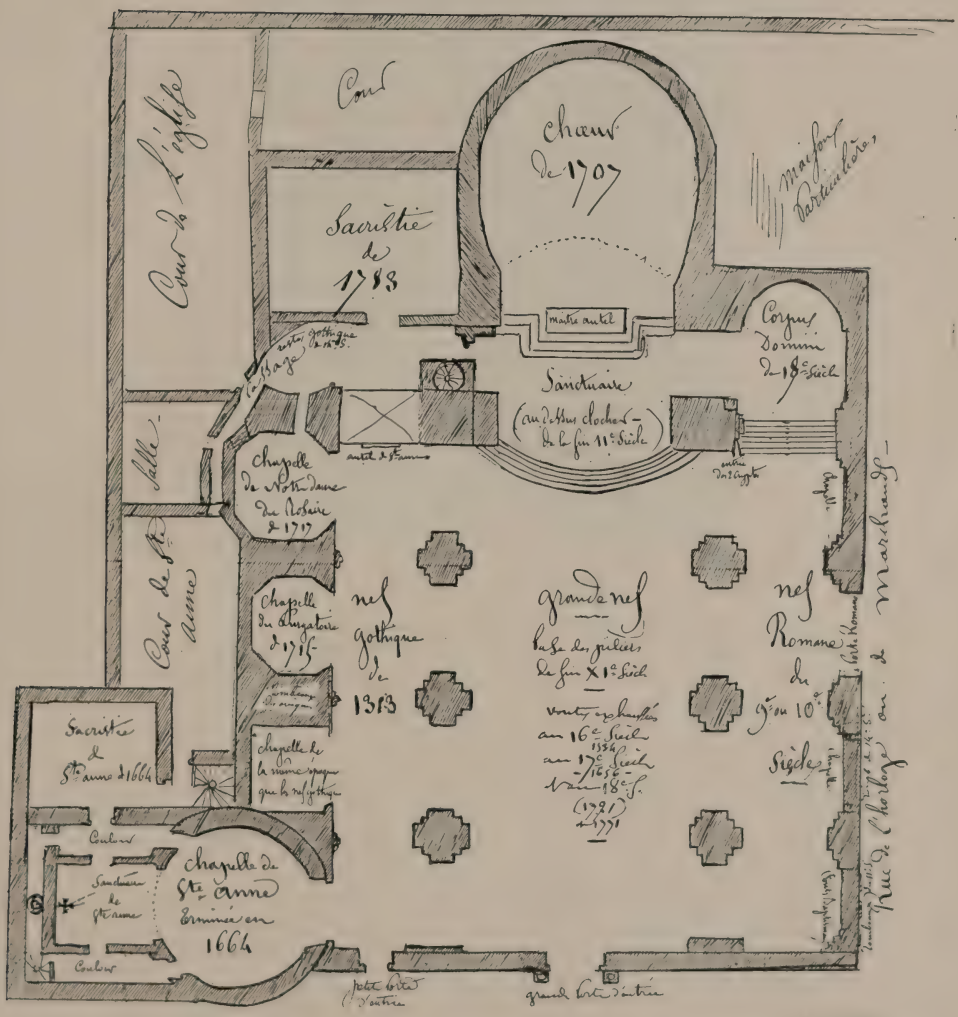
pears possible that the Greek curves might never have been discovered. We know that Pennethorne was prompted to look for the Parthenon curves by connecting his memory of those at Medinet Habou with the passage in Vitruvius prescribing the curves. These points are suggested with great deference to Professor Norton's superior knowledge of the matters concerned, and they may be summed up as follows: The absence of literary mention during the Middle Age may not be especially surprising, in view of the close bonds, professional jealousies, and traditional secrecy of the Masonic guilds. The ultimate abandonment of optical refinements is preceded by an earlier dwindling away of the exceptional prominence which obtains for them in the eleventh century, especially in the Pisa Cathedral and St. Mark's. The Renaissance does show very late and very distinct survivals. Altogether, I think we shall be led by a study of this subject to a more vital apprehension of the overwhelming shipwreck which the Italian Renaissance brought upon mediaeval art—a shipwreck clearly prophesied in the Italian Gothic.

A most remarkable case of the survival of mediaeval tradition, without the assistance of literary record, has been brought to my knowledge by Mr. George L. Heins. It appears that Scotch masons of Halifax, Nova Scotia, have actually been applying the entasis to church spires in our own generation, as a traditional expedient. They have explained to Mr. Heins their empirical method for obtaining the desired curve and their explanation of its use was that "it looked better so."

Of still greater interest is the fact that the designs of Messrs. Heins and La Farge for the new Episcopal Cathedral of New York include a series of refinements similar to those which obtain in the Cathedral of Pisa and other mediaeval churches described in these articles.

Wm. H. Goodyear.

(*To be continued.*)



SKETCH PLAN OF THE CATHEDRAL OF APT.
An unpublished drawing by M. Garcin.



WEST FRONT, SENEZ.

FRENCH CATHEDRALS.

Part XI.

THE CATHEDRALS OF PROVENCE.

SENEZ

THE little town of Sénez is about twenty-two miles from Digne, but the railroad only runs to within four miles of it. It is wholly outside of travel, and even a Frenchman would hesitate to visit it unless urgent business took him there. Your landlady at Digne will eloquently maintain the town contains nothing of interest, and only by the most persistent effort can a visit to it be accomplished. Whatever importance Sénez may once have had it has so completely disappeared that to-day it is only a poor hamlet, in which the little cathedral is the one important building. Though not the smallest cathedral in France it is one of the least known, and certainly one of the least visited; some extended reference may, therefore, be made to it.

The close proximity of the town to Digne is sufficient explanation for the similarity between the cathedral churches of the two cities.

In plan they are almost identical, save that at Sénez the transepts have semi-circular apses on the east, and the central apse is also a semi-circle. The nave has a pointed tunnel vault, rebuilt in the present century, carried on three single arches resting on corbels. It is lighted by featureless round headed windows. The apse has a very short rectangular part, with a tunnel vault slightly higher than the semi-dome beyond. At its entrance is a double arch, the lower of which rests on applied half-columns, with cushion-like capitals, having a rosette on the centre face. It is lighted by three round-arched splayed windows.

The transepts have pointed tunnel vaults, with double arches and half-columns at the nave, as at the nave apse entrance. The apses are similar to the main apse, but have no opening arches, and only a single window. The sacristy is under the tower, and immediately adjoins the west wall of the south transept. The corresponding place in the north transept is the usual entrance to the cathedral, through an outer room or porch, devoid of architectural interest. The apse of this transept is enclosed by a screen in a modern Renaissance style. The cathedral is so small that the choir stalls extend beyond the transepts into the third and fourth bays of the nave, most of the interior being thus used for the altar services.

The exterior is as simple as the interior. The west front recalls that of Digne, though much less elaborate; it is in a very bad state, with a large crack on the north. On each side is a plain buttress, with the portal in the centre. It is a pointed archway, whose columns, three on a side, have disappeared. The arches are delicate roll mouldings, separated by fillets and hollows; the outermost is decorated with regularly disposed foliage, now in a bad state. At one time these arches were painted in color to resemble variegated stones, and traces of red, black, yellow and white may still be seen on them. On each side is a projecting stone that may have been carried on an outer column as at Digne. The lintel bears the date 1837. Above is a slender, round-arched window, whose splay is edged with a delicate roll moulding. The rather sharply pointed gable is without ornament or finish.

The side walls are almost featureless. On the north the first bay has been filled up to the depth of the plain buttresses, giving the window an external splay of enormous depth. The transept is perfectly plain, with a gable raised above its original inclination. The south wall retains its original buttresses, but the old windows have been blocked up and new ones cut. The tower adjoins the south transept, as at Digne. It is now an almost shapeless mass rising not far above the nave roof. The lower part of its south face is built out in buttress form and continued around on the west. Above it is divided into two sections by a string, with two small round-arched

windows in the upper one on the south side, and one on the west. It has a very flat roof of wood, above which, on the north side, are two small open arches with bells.

As is frequently the case with the early cathedrals of Provence, the most interesting portion of the exterior is the east end. Here the three semi-circular apses are divided into bays by slender half columns, of which the central apse has four and the smaller one two. The cornices are formed of small pointed arches on triangular corbels. Over the central apse, in the nave wall, is a small, round window, with double recessed frame. The gable end, which is unornamented, was raised when the vaults were rebuilt in our century.

It need scarcely be said that a building so simple as this, a structure so decayed, and now almost uncared for, devoid of architectural interest, and without monumental form, is of small importance in the history of architecture. It is, however, interesting, as illustrating a simple and elementary type of building, and viewed from the southeast its wood roofs, with their long, spreading lines, its tower and its apses, make a whole that is distinctly picturesque, and certainly quite unlike any other cathedral exterior. It is evidently of the thirteenth century, and its consecration is recorded to have taken place in 1242. Its restoration in the sixteenth century, after it had been ravaged by Francis I. in 1536, and by the Protestants four years later, does not appear to have been more than was sufficient to refit it for the uses of divine worship. The later restoration in the early part of the nineteenth century was scarcely more extensive. At the most, it is a slight and unimportant fabric that has been subjected to sundry structural repairs, rather than to restorations and rebuildings, resulting in a somewhat picturesque pile that has been almost wholly overlooked by the historians of architecture.

APT.

Of the many Provençal cathedrals which have suffered from rebuildings and restorations none has been more unfortunate than the cathedral of Apt. Consisting of a south aisle of the ninth or tenth century, a central nave of the end of the eleventh, a north aisle of the early fourteenth, with chapels and a sanctuary of the seventeenth and eighteenth, and with almost countless repairs, generally in a debased form of art, carried out at the time most unsuited to such work, it presents a strange medley of unimportant parts with scarcely archaeological value. It is a church of some size, being about one hundred and sixty-five feet in length, with a central nave twenty-four feet wide. And its past history has been one of the most famous in France; for the church contains the relics of S. Anne, the mother of the Blessed Virgin, which, so the story runs, were brought here by a pious pilgrim to Palestine, sealed up and forgotten in the

crypt below ground, miraculously discovered in the presence of Charlemagne, and subsequently the object of the greatest veneration, that has not diminished in our own day. But the treasure amassed in nine centuries of pilgrimages disappeared in the Revolution, so that, to-day, it depends on its past glories rather than on its present possessions. Unfortunately, there is no record that Charlemagne visited Apt, save that contained in the legend telling of the finding of that body; but there is no disputing the religious fervor this relic excited, nor the subsequent fame of the shrine.

The date of the south aisle, the oldest part of the cathedral, is not now known, but it may, with the utmost confidence, be attributed to an epoch prior to that of the central nave, which is known to have been built towards 1056. It has been claimed that the central and south aisles belong to the same period, and are the remains of a two-aisled church repaired in 1056. Such a plan would have been wholly extraordinary, and the supposition, moreover, is not supported by the structures nor by their detail. There appears, therefore, no reasonable doubt that we have, in the south aisle, the remains of an ancient church to which the other parts were subsequently added. It is four bays long, with an elevated chapel at the east end, rebuilt in the eighteenth century, and corresponding with the crossing bay of the nave. The first bay to the west shows the Gothic character of the north aisle. The three remaining bays exhibit the original aspect of the ancient church. The low vault is constructed in a singular manner, being half a barrel vault on the south side and a half-cross vault on the other. Double arches divide the bays, forming deep recesses, used as chapels, on the south side. Over them runs a richly carved frieze, which is repeated on the north piers, where only the second and third bays retain the primitive wall arches, now opened into the nave below higher arches within it. The fifth bay, which is elevated to a level with the sanctuary of the nave, has a tunnel vault at right angles to the preceding ones. The semi-circular apse is entirely covered with decorations of the eighteenth century.

The central nave has been repeatedly repaired, its vaults having been subjected to alterations in the sixteenth, seventeenth and eighteenth centuries, with further restorations, including the whole cathedral, in 1840. But it is known to have been built by Bishop Alphant, about 1056, and its original characteristics must, therefore, have been those of the Provençal churches of that date. But the vaults are now pointed cross vaults, built about 1721, and which almost amounted to a rebuilding of the nave—round-headed windows which form a clerestory over the round longitudinal arches. The bay of the present century—the fifth bay—is the sanctuary, and is elevated five steps up, with the entrance to the crypt below. It is a

domed bay of the Provençal type, with deep single low arches on the east and west, and double corbelled arches, not unlike the system of Notre Dame des Doms at Avignon, on the north and south. The octagonal dome, with ribs in the centre of each face, is supported by the usual pendentives with symbols of the Evangelists. Beyond is a shallow bay, raised two steps up, with a large pentagonal choir or apse, built in 1721. A good deal of tawdry decoration, including a huge gilded glory around a painting of the Transfiguration over the entrance arch of the sanctuary, deprives these parts of the little architectural value they have.

The north aisle was added in the early years of the fourteenth century by Hugues de Bot, elected bishop in 1313. It is an unimportant addition in the thin Provençal Gothic. No attempt was made to amalgamate it with the older parts, but everything was started afresh, new piers being applied to the older ones, making these members unusually thick. The construction is most irregular, arches, columnettes, supporting members and vaulting ribs exhibiting a diversity that suggests poverty of ideas at the outset, and constant and unfortunate repairs afterwards. It is but four bays long, and is closed by a wall cutting off space for a passage, beyond which is the sacristy adjoining the choir.

In 1660, Anne of Austria made a pilgrimage to the shrine of S. Anne and, as a part of her offerings, contributed a large sum of money for building a chapel to the saint. It was erected by the celebrated Mansart and dedicated in 1664, supplanting a smaller chapel built in 1313. It is at the west end of the north aisle, and whatever character it may originally have possessed has been lost in the paint, chiefly solid body color, that has been applied to it. It consists of two parts, an octagonal bay next the aisle, with a circular dome, and an outer rectangle with a coffered vault. The relics of S. Anne were transferred to this chapel when it was finished, and at one time it contained many rich and splendid works of art that disappeared in the Revolution. Smaller chapels open from the other bays of the aisle, that in the second, now used for the storage of chairs, being contemporary with it, while the two succeeding chapels are uninteresting structures of the early eighteenth century.

The general effect of this interior is one of utter tawdryness. The architectural forms are of little interest, and the decorations and attempts at decorative effect are so very bad as to be almost depressing. The church is lighted by few windows, and those of small size. Yet when, on a clear summer's day, the great door at the end of the central nave is thrown open, the warm southern sun streams freely in, lighting up every part, and showing the poverty of its architecture and the bad taste of its accessories. The most interesting parts of the cathedral are not, in fact, what we see in this strong brilliant light,

but the crypts under the sanctuary, of which there are two, one above the other. The upper crypt is a miniature church of three short bays, an apse and an ambulatory. It is extremely low, with moulded capitals and round arches. It is attributed to Bishop Alphant, who built the central nave. The word "Ugo" on a stone at the entrance is supposed by some archaeologists to be the name of its builder or master mason. M. Révoil found the same word on the cathedral of Vaison, and has suggested that the same architect was employed in both churches. Both the meaning of the word and any connection with Vaison are, of course, the purest conjectures.

From the upper crypt a long narrow passage leads to the lower, which is simply a very low corridor that formed part of the Roman aqueduct that carried the water to the theatre of Apt. A small niche is famous as having been the hiding place of the relics of S. Anne.

The exterior of the cathedral is even more featureless than the interior. Its west front alone is free from other buildings, but no compensation for this is offered in the mediocre entrance of the eighteenth century, or in the false formless gables of the aisles. To the left the dome of the chapel of S. Anne forms an odd contrast to the lantern over the central dome and clock tower, built against the south wall in 1565. On the south wall are some remains of the cloister, and a small Romanesque doorway, unornamented, opens under the clock tower that spans the street; almost all the rest of the exterior is surrounded by houses and other buildings. The central lantern is square, divided into two bays on the north and south faces by a central half column, repeated on the corners, and with two windows in each bay. It is surmounted by a low four-sided pointed roof.

The cathedral of Apt is not visible to the traveller as he approaches the city from Cavaillon; but as the train moves on towards Volx—on the route to Forcalquier—the track rises to a height above the city, and the whole is clearly visible. It is then seen to dominate the city, but without the grace and beauty of the northern cathedrals or the sturdiness and strength of many of the southern churches. One takes away with one a sad remembrance of this melancholy cathedral, whose history was once so brilliant, but whose architecture, even in the best period, scarcely rose above the level of the ordinary.

Barr Ferree.



Fifth Avenue, N. Y. THE HOLLAND HOUSE.

THE WORK OF GEORGE EDWARD HARDING & GOOCH.

THE Commercial Cable building is about the most importunate structure in New York. It is not the kind of edifice which is done all at once, "designless, self-created and forlorn," as the poet says. It implies a series of previous attempts upon the public, at least the building public, and a pretty clear conception of what it wants and of what it will stand. What it wants practically, that is, and what it will stand artistically. The genesis of such a work of art ought to be interesting, and the edifice worth tracing back to its sources.

The sources are not very remote, according to the scale of the geologist or even of the historian. But they go back to a respectable antiquity in the brief chronicles of the sky-scraper. It was "away back in the early nineties," possibly even in the late eighties, when the Holland House was built, and this, I believe, was the first of the

series. Architecturally, this edifice is rather a platitude, but it is a decorous and inoffensive platitude. According to the dictionary, platitudes are "weak, empty, trite or stupid remarks," but it is the triteness that is most obvious in this design, and that one means to emphasize in calling it a platitude. It is not an extreme elevator building, being but of ten stories, and it is not even clear at a glance that it is a steel frame building. The masses look adequate for actual masonry. One does not demand novelty in a new building and, indeed, the pursuit of novelty for its own sake is apt to result in something worse than a platitude. But one does demand an intelligent and individual analysis of the regular thing, and that is what one looks for in vain in the Holland House. It shows a confused apprehension of things that everybody is agreed about. A two-story basement with plain piers, retreated screen wall and intermediate mullion piers. Agreed. A middle section emphasized by a feature running through, sometimes an order, in this case a series of arches at the centre. Connu! An attic of a richer treatment, with a projecting and enriched cornice. Too true. All depends on how it is done, and upon whether the designer brought anything of his own to add to the consensus of mankind. I cannot see that he did. On the contrary, he shows, as was first said, only a confused apprehension of that consensus. The cornice seems to request us to ignore the additional story above it, and we will kindly do so. But the three-story attic is not a crowning feature, an integral part of the design but a building superposed upon another building with the effect not of completion, but of competition. Moreover, "mostover," the main central motive of the building, the range of continuous openings in the middle division is so weakened and diluted in execution that it makes scarcely any effect at all. Obviously, to have their due effect, the arches should be grouped at the centre. Perhaps it is the Hotel Imperial, from which the designer immediately took his motive. There the whole face of the design is the grouping of the continuous arches at the centre of the front on which there is more than one. It is possible to widen the piers so as to pierce them with windows, without losing the effect. It is not so managed here, however, and the weakening effect of the wide separation of the arches is completed by the fact that there is scarcely any contrast between the openness of the centre and the solidity of the wings, and that the architects have not even made the wings symmetrical. It is possible, we know, to insert shallow oriels in the large openings without destroying their effect, but it is not possible to keep any effect while spreading the openings at the ends, instead of concentrating them, and while inserting a pier two windows wide at the centre between them. By this disposition the motive is so adulterated that it becomes void and

of no effect. The basement is much the best, as it is much the least pretentious thing in the building. On the side the baldness of it is more suitable to a warehouse than to a hotel, but on the front this is relieved by the porch. This porch is much the best thing in the building, the only thing, in fact, that indicates that the designer was interested and enjoyed himself in doing it, and which was not "wrought in a sad insincerity." The interior is noteworthy for the sumptuousness of the marble with which it is lined. A trite classical quotation will fit it very well, with the change of a single letter: "Materies superat opus." Not that the "opus" is bad. On the contrary, the carving of the newels of the staircase is distinctly good, and appreciative of the material. The evident enclosure of steel posts with slabs of marble, in place of the more usual imitation in a marble veneer of a marble column or pier, is also commendable in intention, however much better it might be in execution. If it be not artistic, it is at least rational.

The Postal Telegraph Building is a good deal more pretentious than the Holland House, and consequently a good deal more exasperating. When a born platitudinarian feels the public demand for "something new" the results are apt to be awful. Ex vi termini he has no ideas, and he tries to make up for the want of them, though of this want he is not sensible, by vociferating his "weak, empty, trite or stupid remarks," and accompanying them with profuse gesticulation. He saws the air too much with his hand, "thus," and yells at you. The "lay-out" of the Postal Telegraph Building is conventional enough. A three-story basement, or four-story, including the frieze-story that counts in with it, a middle part of seven stories, and two attics, the lower much the taller. Excepting the two attics this is all obvious enough, and the exception is very bad. All this, fortunately, is in a monochrome of dull gray. It is something to be thankful for that it did not occur to the designer to variegate it with color also. His variegations in form are quite sufficient. The middle part, being the plainest, is much the least bad; on the front, a centre, recessed by an offset of a few inches; three very wide windows are inserted between two lateral piers, each with one narrower opening in each story, and the decorated sill course crosses the whole front. On the side, the plain pier with the single opening is repeated at each end, while the wall between is divided into three parts, marked by a broadening and projection of the pier between them and a consequent little jog in the sill course. Each of these parts is three windows wide. These windows, while they are wider than the single openings of the angle piers, are apparently narrower than the central windows of the front, and, like them, carry a projecting keystone or imitation of a keystone at the centre, which is omitted at the ends where the flat arch is left undecorated.

Considering that all this is so plain it is curious how it can be so bad. Certainly the plainness of it, in connection with the respectable breadth of the enclosing pavilions, ought to be conducive to repose. And yet so far from making the spectator drowsy, it murders sleep. Nobody can look at it without experiencing some irritation, and if he looks at it long, it "gets on his nerves," just as the street-noises get on his nerves if he lies awake and in spite of himself listens to them. The explanation is the same. The thing is a bundle of discords. Mark Twain, talking about Cooper's style, has a very happy illustration which applies to architecture as well as to literature: "When a person has a poor ear for music he will flat and sharp right along without knowing it. He keeps near the tune, but it is not the tune. When a person has a poor ear for words, the result is a literary flatting and sharping; you perceive what he is intending to say, but you also perceive that he doesn't say it." The analogous deficiency in architecture is exactly what this middle and least bad part of the Postal Telegraph Building shows. In the description it would seem at least inoffensive, but look at the photograph, or, better yet, look at the building. Everything is just wrong. "He will flat and sharp right along." The relation of the wider openings to the narrower, the little protrusion of the piers on the sides, just sufficient to break up the effect of breadth and repetition without substituting the effect of powerful masses, organically related to the whole:— all these things show a profound and innate insensibility. You say when you see them that this designer was born form-blind as some people are born tone-deaf.

But still this middle part is much the least bad. The insensibility it shows is rasping to normal sensibility, but it is only an honest dullness. At the top and bottom the design breaks out into sensational things with an awful effect. Of course we know what dreadful things may happen when mere dullness is goaded by competition into showing off. But it scarcely seems possible that the same designer who did the honestly ugly middle did the top and bottom. These goocheries, if one may hazard the conjecture, are what add vulgarity to ugliness. That swaggering, flat-arched three-story entrance, with the hemicycle inside, out of scale and keeping with everything else in the building, is itself without form and a huge void. There is no modelling, no design, no ornament but the huge keystone that still further depresses to the eye the centre which even in a flat arch of these dimensions the eye demands should have some suggestion of a rise, and seems to load the arch at the very point where a load most enfeebles it. The springers, on the other hand, where some modelling to express the abutment was really called for, are left quite bald.

It is a singularly ugly feature, and yet not so ugly as the double



THE POSTAL TELEGRAPH COMPANY'S BUILDING.

Broadway, corner Murray Street, New York City.

attic. Why a double attic no man knows; still less why this double attic. The withdrawal of the central wall of the front and of the three divisions of the sides, where the piers that so annoyingly disturb the middle part at last have a meaning, might be well enough if it had an apparent motive, and were very differently managed. But there is no motive apparent except to make architecture. Even the emphasis of the pavilions for which the withdrawal offers opportunities which it is hard to escape, is entirely lost by the carrying of the huge cornice across them, and by the superposition of the second attic. This crowning feature, withdrawn into huge loggias of no use or meaning, becomes the crowning absurdity of the building, while the treatment of the preposterous lunetted cove, which may be in fact of terra cotta, but which, to all architectural intents and purposes, is of sheet-metal, becomes its crowning vulgarity.

It is really a terrible structure, of which the terror increases the more you contemplate it. And the terror is increased because it adjoins the building of the Home Life. That front is really one of the most intelligent compendiums that have been made of what had been arrived at in the architecture of tall buildings at the time of its erection. The relation of the base and crown to the shaft; the relation of the sides to the centre; the relation of the features to the mass; the relation of the detail to the features—all these things are just, granting the designer his postulate, which all the designers demand, that his building is of masonry. Moreover, there relations have the rhythm to which the designer of the Postal Telegraph has shown an aggressive insensibility. One is a scholarly performance. The other is zero, when it is not an emphatically minus quantity.

It remains to be added that on the fourth side, which from the North River is the most conspicuous side, the architect has frankly abandoned architecture, and left the wall and the "elevation" to the builder. He has not recognized that this side is conspicuous at all. Of course this is a common offense, and frequently committed by architects who would much resent having it said that they were not artists. But are they? A designer who exhausts his powers upon the fronts which are to be seen close at hand, and adjoins to them fronts which at a distance are just as much in view, and to the effect of which he pays no attention whatever, has the air of one trifling with his art. When we say that the bald brick back of his building has no design, he has to admit it, and defends himself by saying: "But if you want to see what I can do, just go round to the other side, where my architecture is." When we do this, we may find that we prefer the part from which architecture is omitted. But he has no business to like it better, for that is an admission that his building would be better without his art, an admission that he cannot be prepared to make; and his excuse must be that

he is not paid for more than one or two elevations. This is not exactly what you can call an artistic spirit. In the present case the back of the building which has escaped the designer's notice, might please the beholder better than what has engaged his attention, if the owner had not recognized the conspicuousness which his architect ignored. He has availed himself of it to cover the upper part with a huge sign, legible from afar, which is offered to us in lieu of an attractive piece of architecture. The addition of the advertisement to the blank wall has the advantage of making the spectator really regret the omission of architecture from this front, even the architecture of the other fronts, and the further advantage of vividly illustrating the triumph of the vulgarizing tendencies which the artistic designer of commercial buildings has to resist.

Undoubtedly, the Gerken Building is a relief after the Postal Telegraph, moderate as is that praise. It is of an extreme simplicity in the middle part. The basement and the attic are given to architecture, more or less, but the architecture of the basement is mostly shrouded from view by the structure of the elevated railroad, and, so far as it is visible, is protected from criticism by the straightforwardness of its utilitarian treatment, in which there is neither architecture nor the denial of architecture. The mere fulfilment of necessities is always respectable, and there is little more in this basement. We may grant the designer the bits of carving at the angles, which are the only pieces of design in the basement, excepting the main entrance, which in itself is neither here nor there, but derives a look of meanness from being crowded into a place too small for it. But upon the whole the three-story basement may pass very well as a mere warehouse, and so may the seven-story middle which has no ornament whatever, except the thin keystones of the upper story, which are too slight for any effect, good or bad, and the moulding of the sill courses, of which the same may be said. The only feature is the truncation of the angle to a face not wide enough for one of the openings of the sides, and in which, accordingly, a narrower opening is introduced. This change in form of opening, which in the Postal Telegraph building is a deformity, is here rather a felicity. So much depends upon circumstances in architecture. The narrowing of the opening here explains itself. Moreover, the ample pier, for which it gives room, counting from the window of one side to the window of the other, reinforces the mass at the angle, where it most needs visible strength. It is the first evidence of rational design that we have encountered in this survey.

All this is either positively or negatively good, because thus far the designer has confined himself to doing what he had to do. But above this stalk comes the blossom, and the blossom is not beautiful. We may grant the designer the triple subdivision in the uppermost of its three stories of the openings which are left undivided in the lowest,



THE GERKEN BEILDING.

West Broadway and Chambers Street, New York City.

but the story between departs from the utilitarian treatment that elsewhere prevails, and is so much richer as to denote an entirely different destination. A mere loft is converted into an ornate apartment which contradicts its surroundings. Moreover, the pilasters which were meant to adorn the piers serve only to enfeeble them. Still it is decidedly the most creditable, because or in spite of being the least pretentious, of all the works under examination.

A project which, up to date, remains on paper is that for a twenty-story building at the corner of Broadway and Reade street. This exhibits several peculiarities of design. One of them is that the basement is a complete building in itself, and taken by itself, including the



THE DUN BUILDING.
Now erecting N. E. corner Broadway and Reade St.

crowning cornice, would not suggest that anything was to be built above it. Moreover, it is of the unusual height of six stories, which is to say of the maximum altitude of the pre-elevator days. Considered by itself it has good points. We have already quarreled, in the Holland House, with the designer's adulteration of his principal motive by widening the piers between his large openings and piercing these intermediate piers with windows. Here that mistake is avoided, and the immediate precedent, if it was so, the Hotel Imperial, is much more literally followed to the considerable advantage of the building. Here, as in the original, there are three openings running through at the centre of the longer front, and one at the centre of the shorter, and although the abutments are pierced, the openings are not large enough to disturb the sense of sufficiency, and, therefore, of repose. Moreover, the truncation of the angle which we first found in the Gerken Building is repeated, and here as there the effect of it is good. The chief trouble with the basement is the construction of a feature at the centre of the Broadway front which has absolutely nothing to do with the case. This is the lintelled opening which includes the central windows of the second and third stories, and is as objectionable as the hemicycle which forms the entrance of the Postal Telegraph Building. In respect of irrelevancy it is even more objectionable. The object in each case is to signalize the entrance by a central feature. But in the other case it was really the entrance that was signalized, whereas in this not only is the entrance lower than the feature, but it is apparently not even under it, and access to the building is in fact gained through inconspicuous tunnels at the sides. It is a most unscrupulous case of making architecture. But for this, and with more and different development of its crowning member, the basement would not be a bad six-story building as commercial buildings go.

But its merits disappear when it is seen in the connection that was designed for it. The nine, or ten, story shaft also has its merits. They are the same as those of the substructure, or of the Hotel Imperial, in that a large central opening or range of openings is included between two powerful and visibly sufficient abutments, which the openings in them do not avail to weaken. It is true that the whole scheme is irrelevant to the "bottom facts" of a steel-cage construction. The arches do not exert the thrust they seem to exert, the seeming masses of masonry are not masses but only veneers, and consequently they do not need and do not employ these seemingly powerful abutments which in turn do not resist the thrust they pretend to resist. But this, as has before been intimated, is a radical criticism which no designer of tall buildings has done much to the purpose towards obviating. We must grant all designers what we have to grant the best, and allow them to beg the whole question by

pretending that a steel frame is a wall or a series of piers. All that there is of expressive treatment of the new construction is a mere beginning, and the steel-cage "lacks the sacred poet."

Granting our designers this, then, the middle front of their buildings, like the basement, is not bad when taken by itself. It is a good scheme of a shaft, and is abruptly set off from the base, though it merges into the capital in an undecided fashion, and the "necking" ought to be a good deal more emphatic. But it has to be taken by itself, and it cannot be taken by itself. The motive is a good motive, and the architect has shown appreciation in adopting it. But he has shown much want of appreciation in repeating it. The motive of the shaft is the motive of the base. It cheapens and weakens and makes intolerably monotonous a good notion to work it in once in a building of six stories, of which the notion occupies four, and then to use it again in another building of nine, or ten, stories superposed upon the first, of which the notion occupies nine. On the long front the repetition is unconcealed, and the effect simply tiresome. On the shorter front it is disguised, and to disguise it was very likely one of the motives for introducing that irrelevant piece of made architecture at the centre of the Broadway front. It does not achieve its purpose but adds an effect of heterogeneousness to the effect of simple tedi ousness. As for the third member, the capital, no notion of any kind is discernible in it. It is an assemblage of unrelated parts of which the effect is mere higgledy-piggledy.

Next and last comes the Commercial Cable Building. This is about the most obstreperous structure to which the new construction has given rise. It would probably be assigning altogether too much of purpose to its author to attribute to him the intention of stopping the vista of Nassau street, looking south, with the pushing shoulder and brazen terminal bulb of this edifice. Anybody can see how it looks now, but to infer its effect before it was built would require an amount and a kind of calculation which neither this building nor any of its predecessors warrants us in attributing to its author. To know beforehand just where and how this cupola would emerge, and what the effect of it would be when framed in between the lower buildings to the north of it, would have involved a deal of calculation. But the effect of what was probably a random stroke is the same as if it were a piece of studied impertinence, and the effect is very marked. In fact, the thing from this point of view is as characteristic as it is obstreperous. As the new opera is said to be the most Parisian thing in Paris, so whoever is "held up" on his way down Nassau street by the head and shoulder of the Cable Building, swaggering into the empyrean over everything in sight, with, as it were, a cigar in its mouth, has to own that it is the most New Yorkish thing in New York. Of course the comparison is not favorable to us, but the



THE COMMERCIAL CABLE BUILDING.
Broad Street, New York City.

thing has the qualities of its defects and reeks of a rowdy picturesqueness like cowboy slang.

One cannot attribute this effect to the architect's intention, because for one thing the effect of a corner of the building from Nassau street was much less obvious beforehand than the effect of the conjunction of this building with the Manhattan Life, which, indeed, was so obvious as with difficulty to be overlooked. The Cable Building is virtually a production of the Manhattan Building eastward with an interruption in the form of New street. That is a fact of which it behooved the designer of the newer building to take account, but it is impossible to detect that he has taken any. He has recognized the

probable visibility of his south wall, as the designer of the Manhattan had done before him, not only by the use of a presentable material but by the introduction of some architectural device, especially towards the top. But the virtual continuity of the two he has not recognized by any conformity, either of material or of line. Such a recognition would have enhanced the effect of both buildings, but in fact what architecture appears upon the long side of the Cable Building, in projecting belts, continuous or interrupted is introduced at levels which make the collocation of the two buildings quite needlessly distressing. Neither have these horizontal lines anything to do with the composition of the Cable Building itself, nor do they establish any harmonious relation among its parts. They merely occur in an aimless way, so as to cut up a wall which is a mere thin and equable veneer, too thin to give any assurance of carrying itself and yet giving no indication of the actual structure. The Manhattan leaves something to be desired in that way, but, compared with its new neighbor, it is a very successful essay in the treatment of what is architecturally blank wall, and has a look of massiveness, sufficiency and organization. The belts really seem to tie it together, and the continuation of them across the recess, with the interpolated feature, is very well managed, whereas the recess on the flank of the Cable Building is not architecturally treated at all and counts only as a meaningless jog in a thin wall, which apparently might as well be all in one plane, since the adjoining of another tall building would close up the windows at the ends and leave the recess too shallow to be available for light. It cannot be said that the designer has not considered the distant view. It is for the benefit of the distant viewer that he has put a huge brass knob at either end of the top, giving his skyline two competing features in place of one dominant feature. One of these alone, as we have seen, from a point of view which is apparently accidental, so far as he is concerned, makes an effect of a swaggering and tumultuous kind. The two together make no effect at all, except of aggravating the incongruity between this building and its neighbor, the effect of which it might have improved and cumulated.

Except these things, the architecture is confined to the narrow slice of Broad street front. The top is scarcely apprehensible, and is certainly ineffectual from any point from which the substructure can be seen, and taken by itself is very awkward. The effect of swagger is produced by the topmost member, the brass bulb cut away to let in a double order, but below that there is no effect at all. The uncertainty about where the middle ends and the top begins is confusing and painful. As for the shaft, the central features of a balcony and a triple arch, whereby the architect has apparently attempted to relieve the monotony of nine equal and similar stories, the result of

his labor is that he has managed seriously to impair the effect the succession of stories would have had if he had left them alone, without substituting any other. Really it is only the five-story base which is well enough seen to count, and, unfortunately, this is extremely bad. Nothing more crude, unstudied and reckless, nothing that gives a stronger impression of architectural illiteracy, has been done in the high buildings, at the base of which the designer finds that he is repaid by appreciation for the most careful and scholarly design that he can produce. The crudity of this is really atrocious, and is its most noticeable quality, although there is not a notion here which would be worth a more respectful elaboration. What notions there are are mere freaks, such as the row of grotesques over the main archway with a cable (delightful pun) passed from mouth to mouth. Or the charming idea of jacketing Doric columns with squared ashlar between which the fluting may be discerned. Or the crowning device of giving a violent entasis to the piers thus designed, as if they had buckled under the superincumbent weight.

All this is quite beneath critical notice. And upon the whole the architecture of the series of buildings we have been considering is "either zero or a minus quantity." Why, then, does the producer of it go on producing and to produce? There can be but one answer. He gives owners what they want practically, and owners neither know nor care, so long as the architect does that, what he does artistically. At least if they know they do not care, and if they care they do not know. The moral of the result seems to be that architecture, in commercial buildings, is the architect's personal amusement. He must not indulge in it to the prejudice of practicality, but if he produces what his clients want, his architecture may be as good or as bad as it likes, without affecting his professional success. That seems to be the fact, and it is not without its encouraging side. For if clients do not interfere to prevent bad architecture neither do they interfere to prevent good.

A LONG-FELT WANT.

To the Editor of the "Architectural Record:"

IN behalf of the architectural profession I address you upon a subject of the greatest interest to all the busy members of that profession. They now find that much more of their time than they can afford is spent over drawing-boards, and much more of their commissions than they can afford is laid out upon draughtsmen. This is a time of eager competition, and in order that an architect may live it is absolutely necessary that he should spend most of his time in looking out for profitable work. If you will pardon the vulgar expression, he must "hustle for a living." If he stays in his office, in the old-fashioned way, and puts in his time in supervising the work of his draughtsmen, he is sure to fall behind. More than that, if he has any important work on hand, his time is taken up in conversation and correspondence with a host of contractors and material men. If it is a commercial building he is engaged on, he is liable to an almost daily hounding by his client to quicken the rate at which the work is going forward. His professional reputation is at stake in getting the building done at the earliest possible moment, and he has a natural and laudable ambition to beat the record for speed in buildings of the same class and size. For professional purposes every hour that he spends over a drawing-board is lost to him. To a busy architect nothing can be more ridiculous than the clamor of ignorant laymen for an "original style of architecture," as if he had nothing else to think about than design. The people who expect such an architect to be pottering over the architectural detail of his buildings simply do not know what they are talking about. If he devoted his time to design he would have nothing to design; and what good would his designs do anybody?

Architects know, what the public does not seem to have found out, that the recent classic revival has not been a matter of choice, but of necessity. If the most popular and successful architects had undertaken to work in any style in which they had to design, or even to adapt their own detail, they would have delayed their work so as to lose their reputations as business men, and they would not have had any time or any money left for themselves, what with pottering over details and the increased expenses of their draughting-rooms, which with the utmost economy threaten to eat up all their profits, even as it is. I suppose it would not be fair to describe the classical revival

as a modern invention. If it were, I should have no hesitation in pronouncing it one of the greatest labor-saving inventions of the age. If we were still doing Gothic or Romanesque, an architect would have no time to himself at all. Since the classic revival has been introduced by the efforts of the architects, it is possible for an architect to snatch a brief respite from professional cares. As soon as his work is done and he has secured a profitable commission, having laid out his building and designated the style, he can take a trip to Europe and leave the detail to the boys.

But, even so, he often finds himself disappointed in the effect of his work, if I may call it so. The classic formulas are, as I have said, the greatest labor-saving devices of which the history of architecture gives any account. But they do not go far enough, and this is a subject upon which I venture to address you. Though the architect need not bother himself with the design of his detail, he has to fix the scale of it for himself according to the distance from the eye and the direction, and this gives him an immense deal of perfectly unnecessary trouble, in which, moreover, he often has his labor for his pains, and finds that the effect is not at all what he expected. Detail is too big or too small, ornaments excessive or minute, modillions look huddled or scattered. Every practitioner of classic architecture knows what a drawback this is. It is a very serious drawback, because even laymen find the work disappointing, although they do not know why. It is all very well to tell them that the thing is correct and according to rule. In extreme cases you may even venture to show them the formula according to which it is concocted, although, as a rule, this course is not to be recommended, for when you show your recipe what becomes of your genius? But it is of no use to tell them that the thing is right if it does not look right. After all, the public is our paymaster, and it is the public that has to be pleased. If it can be pleased with compilations of classic and Renaissance detail, or with reproductions of old buildings, all the better for us. We can get our livings so much easier and cheaper. We have managed to persuade a large part of the public that it takes more genius to compile or to reproduce than it does to design, and if we can keep it in that docile frame of mind the future of fashionable architects is assured. As to the future of fashionable architecture, that is not our business. As I was reading the other day in Stevenson, "words cannot describe how much more important it is that a man should support his family than that he should attain to or preserve distinction in the arts." Those are my sentiments, and I am sure they are those of the profession in general. Certainly they are those of almost every successful practitioner of my acquaintance. The classic revival, if it can be kept up, offers to architects the means of supporting their families with the least expenditure of time in design and of money in office

expenses. This consideration is having increasing weight with members of the profession who have heretofore worked in free architecture, which compelled them to design their own detail, and they are gradually coming over into the classic camp. I met one the other day who is known for his work in Romanesque and Gothic, and he announced to me his conversion, and said that he found he much preferred to work in classic. Of course, I was pleased, and asked what had changed him. "Oh," he said, "classic is such a soft snap!" The slang, I beg to assure you, is his, not mine.

But, as I say, it is evident that our paymaster, the public, must be kept good-natured if the present promising condition of architecture is to be maintained, and that it shall be pleased with the results of our labors. This can be attained only if we can get our classic detail reasonably right in scale, so that it may be effective without being unduly prominent. At present, after spending upon the adjustment of it time which we can ill afford to spare we find, especially in tall buildings, that we have made a mistake on one side or the other; that the detail either does not tell at all, or tells altogether too much. And at the best, when it is most successful, it is all a matter of guesswork.

There is no necessity that this should be so. Of course, the degree to which any given detail should be enlarged to be effective at a given distance from the eye is susceptible of mathematical demonstration, and also the modifications that should be made in it to allow for the foreshortening so that it will look right when it is to be placed high in the air, and to be seen at an acute angle. I do not profess to be able to make the computation myself. I am not a scientific man. I am an artist. But the thing can be done, and it ought to be done. I have no doubt that a series of curves could be constructed showing exactly by what percentage a given detail should be magnified, and how it should be modified, at each point on the curve. A manual giving this information in regard to all the classic detail in common use, under the title, say, of "Modern Architecture Focussed," would be the greatest possible boon to the profession. It would at once become the vade mecum of every practitioner of classic architecture, and, as a labor-saving invention for the use of architects, would rank second only to the classic revival itself, of which it is the necessary sequel and completion. Yours, for the good cause,

A CLASSIC.

BOOK REVIEWS.

SOME ARTISTS AT THE FAIR : Frank D. Millet, Will H. Low, J. A. Mitchell, W. Hamilton Gibson, F. Hopkinson Smith. New York: Charles Scribner's Sons. 1893. Pp. XI., 123.

After the lapse of nearly three years it seems still desirable to insist upon a little book which preserves for us some memory of what was best at the Chicago World's Fair of 1893. That something was undoubtedly the decoration in sculpture and in painting, and as that has nearly all perished, such record as is given in this small book should be the more carefully preserved. There are several large subscription books devoted to the Exposition, and these, none of them, ignore the artistic decoration of the Great Show, but as they give very little of it in proportion to their size and cost, the small and entirely accessible book, is more to our present purpose.

Mr. F. D. Millet's paper is, of course, the most important one of the five in this connection. It is he who has entitled his article "The Decoration of the Exposition," and this article alone occupies nearly half of the space contained in the little book we are considering. It has, too, fifteen illustrations, of which all, or all but one or two, are of very great value and deserve permanent preservation. It is certain that such a body of decorative work as was in place at Chicago in 1893 would have received, had it been put up in France or Germany, the honors of a special publication, with large illustrations perpetuating the memory of every great combination and every important detail.

Mr. Millet's article was written with the enthusiasm natural to the occasion. What it has to say about the purely architectural designs of the buildings should be compared with the criticisms made by foreign, and especially French artists, as printed in their own journals. The unending shower of cold water which these latter contributed is really needed to quench the too glowing laudation bestowed upon the plaster facades of the Court of Honor. Every word which Mr. Millet gives to the painting and sculpture of the Exposition is to be received, on the other hand, with that respect which is due to the opinions of an expert: to the dicta pronounced upon the arts well known to him, of one of the first of our living artists. It is not meant that Mr. Millet has tried to make a critical article of his paper. He would be the first to disclaim that and to urge that what he had written was partly in advance of the realized fact and partly mere record; the words, perhaps, being somewhat perfunctory. That does not interfere with our appreciation of the article in question. What Mr. Millet thought it best to say of the works of art he found it desirable to select for comment. and of the tendencies which he noted and thought it desirable to note—these are matters which it is important to keep in mind. If there were a larger and more adequate book preserving the record of these important pieces of painting and sculpture, it would, perhaps, not occur to us to examine this brief one and to select it for comment at this late day, but there is no such book, and the few pages given here, with their dozen and a half illustrations of those works of art, is all that most people can own and preserve as a relic of the important combination of decorative art which was lavished on those perishable structures, which, indeed have already perished.

A Text-Book of the History of Sculpture, by Allan Marquand, Ph. D., L. H. D., and Arthur L. Frothingham, Jr., Ph. D., professors of archaeology and the history of art, in Princeton University. New York: Longmans, Green & Co., 1896.

This book suffers, of course, from the conditions of its being. Of 286 available pages, 113 half-tone figures take up the space of at least fifty pages, and in what remains, an attempt is made to cover the whole vast field from Egyptian antiquity of the early Empire down to the work of George Gray Barnard, exhibited in the Logerot Garden three months ago. The book is written with that very purpose, to tell the public that there was sculp-

ture in early Egypt, in later Egypt, in Assyria 700 years B. C., in Western Asia from 700 to 400 B. C., in Greece before the historic time, and so on from epoch to epoch, from land to land; that there was a sculpture in each of these regions and each of these times, and what, in a general way, that sculpture was like. "To tell the public," has been said above, but the well-informed student of art, who is not exactly "the public," will find enough in these pages to surprise him. This, indeed, is inevitable. Who is so well-informed that he may not be surprised by the reading of some of the statements made in this book, which statements, however, are capable of demonstration? While every student of the subject has his favorite epoch, in which he thinks himself a discoverer and a principal authority, other epochs and styles will be less known to him, as is inevitable; and what there is admirable about this book is that such an enthusiastic student as we have imagined, is pretty sure to be surprised at once by the appearance of something about his own particular department, and also by the appearance of facts new to him and conclusions which he had not ventured to reach. In other words, the little book is remarkably complete. It really covers the ground, and this is a statement which it is a pleasure to have to make.

That which satisfies the reader the least is the chapter on American sculpture, but this was to be expected. Twelve pages was proportionately a good deal to allow for the forty years of American sculpture plus the occasional moments before that epoch when a single work of art was produced, and yet, in these twelve pages a great many names had to be mentioned, and the work of the sculptors in some sense appraised. This is where the insuperable difficulty has appeared. That one sculptor of great ability and celebrity should be merely mentioned while one of less renown, much younger, and in the opinion of many, less meritorious, should receive a half page of comment is merely the carrying out of peculiarities of opinion; it is not that, but the hopelessness of qualifying each artist in his turn in the few words allowed him which makes this chapter so unsatisfactory. In the work of other times, removed from us by even a few years, and in the work of other lands than our own, some general qualification may be and is attempted; moreover, the perspective which time and distance afford us gives to the student a natural and easy grouping which allows him comment where it is most called for. Our American work is too near to us to allow of this. Who shall distribute our sculptors in groups and speak of them otherwise than as separate and detached individualities?

The tone of criticism is excellent. But a few words could be given to those general remarks in which criticism of a school or an epoch can best be conveyed, but those few words are almost always the best words possible. Since the criticism is good, it stands to reason, considering the sense in which the word criticism has come to be employed, that the knowledge of technical methods, the discrimination between different styles of modelling and the insight into artistic significance are all of marked excellence. Indeed, the text of this book shows to one who will read it with the close care which so compressed a piece of writing requires, this equipment for the task completely embodied in the resulting work. The paragraph beginning with the words "Technical Methods," on page 76, should be read with minute care down to the end of the Chapter, as an instance of what is here meant. It has proved impracticable to make a selection for quotation here, and three pages and a half, even of this small book, are too much to reprint in our columns; but if one wants to know in brief what the Greeks meant by their sculpture and how they expressed their meaning, and if he is prepared to read these two or three pages over and over again several times until their exact sense has forced itself upon him, he will know more about Greek sculpture than was the lot of any one until these recent years had brought with them the possibility of a real insight into the significance of Grecian art. Much of the same excellence of appreciation is to be found in the analysis of mediaeval sculpture. The paragraph at the beginning of Chapter XIV. may here be reprinted in part as an introduction to the subject, "General Characteristics." "The most characteristic fact about the development of art from the rise of Christianity to the Renaissance in the fifteenth century was the supremacy of architecture. The aesthetic qualities involved in love of beauty, orderly symmetry, and artistic form, in poetic conceptions and exuberance of imagination, all have their outlet in architecture. In painting, not external beauty but internal significance, was required. Sculpture, on the other hand, was not used either as a medium for teaching, as painting was, or, like architecture, as an aesthetic vehicle. It therefore played a very secondary part, and not until the close of the twelfth century did it begin to resume its old part as an important factor in the development of art. The Gothic Cathe-

dral paved the way for the Renaissance." This excellent statement of the case is followed by an examination of early Christian sculpture, including Byzantine work, and that is followed in its turn by Chapters XV., XVI., etc., in which the mediaeval sculpture of Italy, France and other nations of Europe is treated. In these few pages there is to be found the best and most satisfactory analysis of mediaeval sculpture which the present writer has ever had the pleasure of reading.

A HANDBOOK OF GREEK SCULPTURE. By Ernest Arthur Gardner, M. A., late Fellow of Gonville and Caius College, Cambridge, and formerly Director of the British School of Archaeology at Athens; Yates Professor of Archaeology in University College, London. Part II.; pp. xvii., 267-552. London: Macmillan & Co. New York: The Macmillan Co. 1897. $1.25.

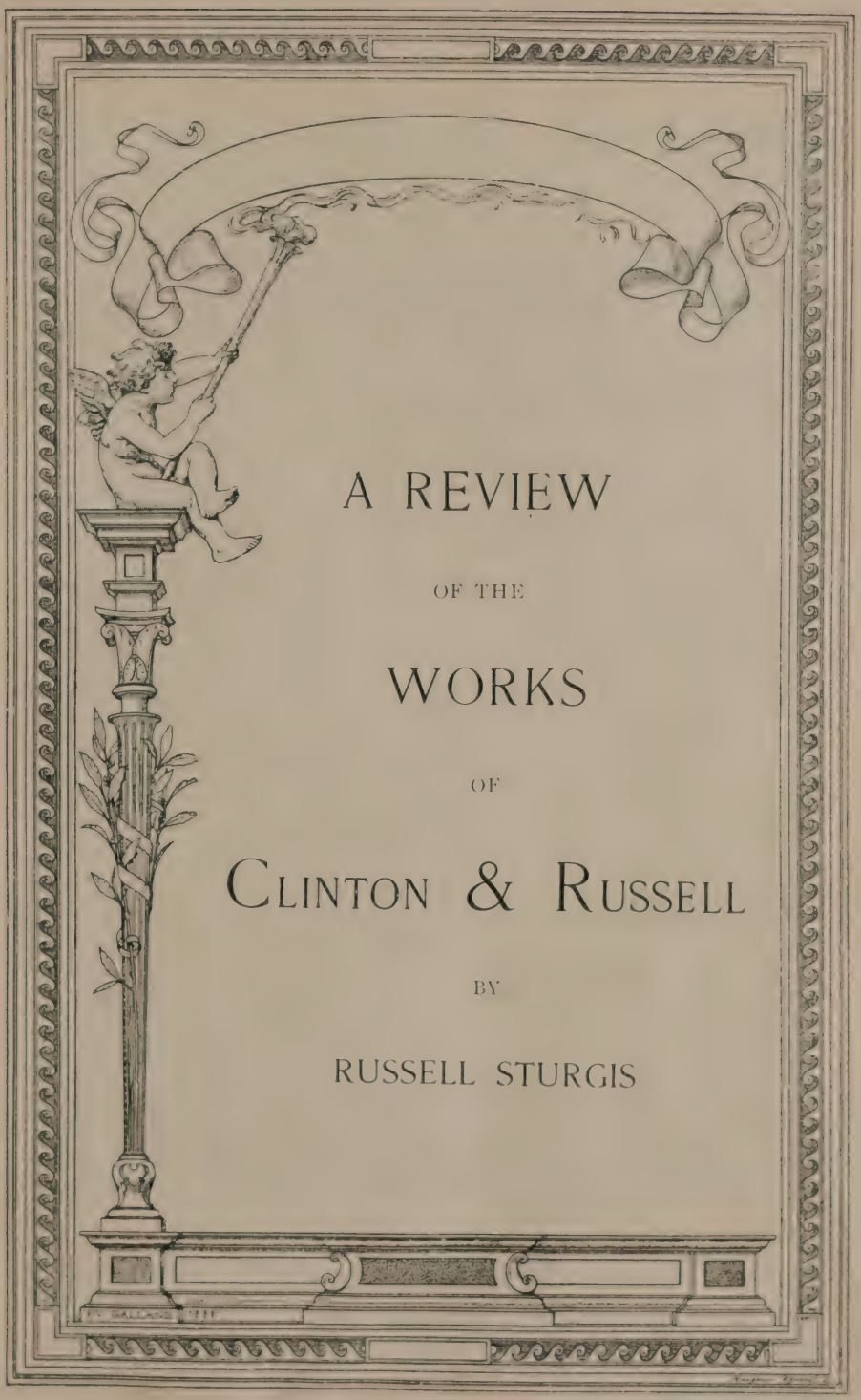
In No. 21 of this Journal (Vol. VI., page 89) the first part of this valuable Handbook was reviewed. The present volume, which completes the work, begins in the middle of Chapter III., and in the middle of the fifth century B. C. The first few pages are thus naturally devoted to the necessarily full description and analysis of the sculptures of the Parthenon. The treatment of these is extremely just and sober. The probabilities of attribution are insisted on with sufficient force to show the writer's convictions, while they are not treated as if capable of positive verification. The only exception worthy of note is the positive statement that the frieze on the cella wall represents the Panathenaic procession; but this is so much the most usual explanation given of this frieze that such a statement may be passed as reasonable enough. it has been said that this is the only exception; it includes, however, several minor ones. Thus, the list of the gods in the frieze is given with a little more approach to positive assertion than is quite safe, and the objects carried on their heads by the two attendants of the priestess in the centre of the eastern frieze are called stools, without allusion to the other explanations that have been given. A complete account of the frieze would require, also, mention of those details which are not possible to understand and which evidently were made out in painting in completion of the sculptured forms. It may be said in this connection that Mr. Gardner is less interested in the matter of the painting of Greek sculpture than one would expect of so enthusiastic a student. What is said on page 430 does, indeed, make partial amends. Here, in connection with the recently discovered sarcophagi of Sidon, he uses the words: "no one who has not seen this sarcophagus can realize the effect produced by a correct and artistic application of color to sculpture." In that case, as in the statues found on the Acropolis in 1885-1886, color was present and plainly visible. The investigation of students, to whom this painting of antique sculpture has been a matter of great interest, show that in many a work not now painted, color was used to complete the design and even to explain the dress, the ornaments, the utensils, even the drapery itself. To us who never see painted sculpture; that is to say, sculpture intended from the beginning to be polychromatic and designed accordingly, it is hard to realize how completely it is within the power and within the range of an able artist to combine color effect with solid form, especially with sculpture in relief. It is not for a moment to be supposed that Mr. Gardner is indifferent to the most fascinating subject, but it may be reasonable to regret that he has not treated it somewhat more at length.

The treatment of the Athenian burial slabs, to which Mr. Percy Gardner has devoted the important monograph reviewed in our last number, in here brief, but, perhaps, as full as the relative importance of the subject admits in so small a book as this. It seems impossible to shake the feeling of the modern student that statues are in some way more important than sculpture in relief, and accordingly the Dexileos tombstone and the Hegeso tombstone, the only sepulchre reliefs of which illustrations are given, would not be alone if equally valuable sculpture in the round were in question. The few words which are given to the tombstones, two pages and a-half in all, are excellent; but inasmuch as all these tombstones, with the exception of two or three, are in the comparatively remote Museum of Athens, it seems a pity that they are not insisted on a little more strongly in order that the world of students may become more interested in them.

This leads to observation of the chief defect from which the book seems to suffer, a certain willingness to accept the popular, or presumably popular, judgment as to the relative importance of works of art, and to yield rather willingly to the pressure which popular demand for information may be supposed to exert upon the scholar who is supposed to supply the demand. The fact that people want to know about statues in our museums may almost be said to constitute, in the eys of the maker of this bok, a reason for the fuller explanation of these works, while the far less known but important works of art remain with

but little explanation. In connection with this, there may be mentioned a certain lack of boldness in departing from the received description of the gallery pieces. Thus, the Farnese Bull, as it is called, that is to say, the group of the Torture of Dirce, in the Naples Museum, is, in reality, more nearly a sixteenth century than an antique sculpture on account of the very elaborate restoration which it has undergone. No one of the four human bodies can be said to be certainly in its right position, and of them, at least one is in a seemingly impossible position. The bull's attitude is questionable, the dog is entirely new, and the whole group is known to have been so far modified as to allow of its being used in connection with a fountain. Now, to treat such a group as this through a page of critical examination and to infer anything positive from it with relation to the school to which it belongs, seems an error of the gravest kind. To weigh the value of this book as a piece of evidence against the value of a wholly unrestored and comparatively perfect piece, is an error somewhat akin to the acceptance of the Laocoon in its modern and restored form, that is to say, with the right arm of the father extended, carrying the folds of the serpent with it. The only safe rule in connection with antique sculpture is to strip the restored piece, in imagination, of all its restorations, and to see what the fragment which has not been touched has to say to us. Mr. Gardner is quite aware of this. In his introduction, pages 9 and 10, he speaks of the restoration of antique sculpture exactly as it should be spoken of; and, yet, the pieces discovered during the last fifty years and absolutely unaltered in surface as well as in general attitude and action, do not receive in these pages, which treat of the later schools, that comparatively respectful treatment which they deserve. What is meant is this: that such a statue as the Hermes of Olympia, which has not been touched by the restorer; or the Apoxyomenos, in the Braccio Nuovo of the Vatican, in which only some of the fingers have been denaturalized; or the Venus of the Capitol, in which the tip of the nose and also some fingers are new; or the headless, draped Niobe in the Chiaramonti Gallery of the Vatican; or the Venus of Milo, in which only the exact slope of the torso is doubtful; or all that is set up and admitted as belonging to the work of the Victory of Samothrace, as untouched as the Hermes—that these works, and such as these, are alone worthy of careful and minute study and of serving as examples from which to draw positive lessons of history or of art. In the matter of relief sculpture, too, not a word is said about the extraordinarily elaborate restorations which have been given to these Hellenistic pictorial reliefs, to which the author has rightly given considerable attention. Professor Schreiber, whose important work on this subject is constantly cited by our author, says nothing of these restorations because he gives them in the fullest way in his plates, each of his photographic reproductions being accompanied by an outline on semi-transparent paper which laid upon the photograph shows accurately what parts are new. In fact, the whole study of the Hellenistic and Graeco-Roman sculpture is modified by the question, which should precede all other questions, as to the authenticity of the pieces themselves. One reason why the Pergamene frieze has been such a prodigious help to all students is that here we have Hellenistic sculpture in relief on a very grand scale, and not restored at all. No doubt it might be argued in behalf of the treatment given to the subject in this book that there has not been room to discuss these opinions. The objection to treating the subject without discussing these opinions is that the student has a right to know what the works of art amounted to, which works of art are given him as examples of schools named and criticised and embodiments of principles discussed. If he finds, as he is sure to find, that some of the most important and apparently accepted of these authorities are really non-existent, having as much modern as ancient spirit in their composition as they now exist, he will dispute the whole doctrine of the book and be too apt to reject the teaching which may well be got in spite of its faulty basis.

Roman sculpture receives less attention than could be wished; but that the title of the book expressly excludes it. We do not find any mention of those remarkable reliefs which, in Trajan's time and in the time of Marcus Aurelius give us an almost Grecian dignity together with their Roman narrative or pictorial power. The sculptures on the Column of Trajan and its copy, the Column of Aurelius, are not the only historical reliefs of the time. Those which are now in the Lateran are even more important as aids in the study of Roman art. It is true that but little attention has been given to Roman sculpture of the Empire and that little of it remains which compares in interest with that of earlier epochs. The neglect of it in the present work is, therefore, not remarkable. It is only to be commented on as one more evidence of that reluctance to treat the subject in a somewhat original and personal way, which is hardly to be blamed, but should be mentioned as a characteristic of the book before us.



A REVIEW

OF THE

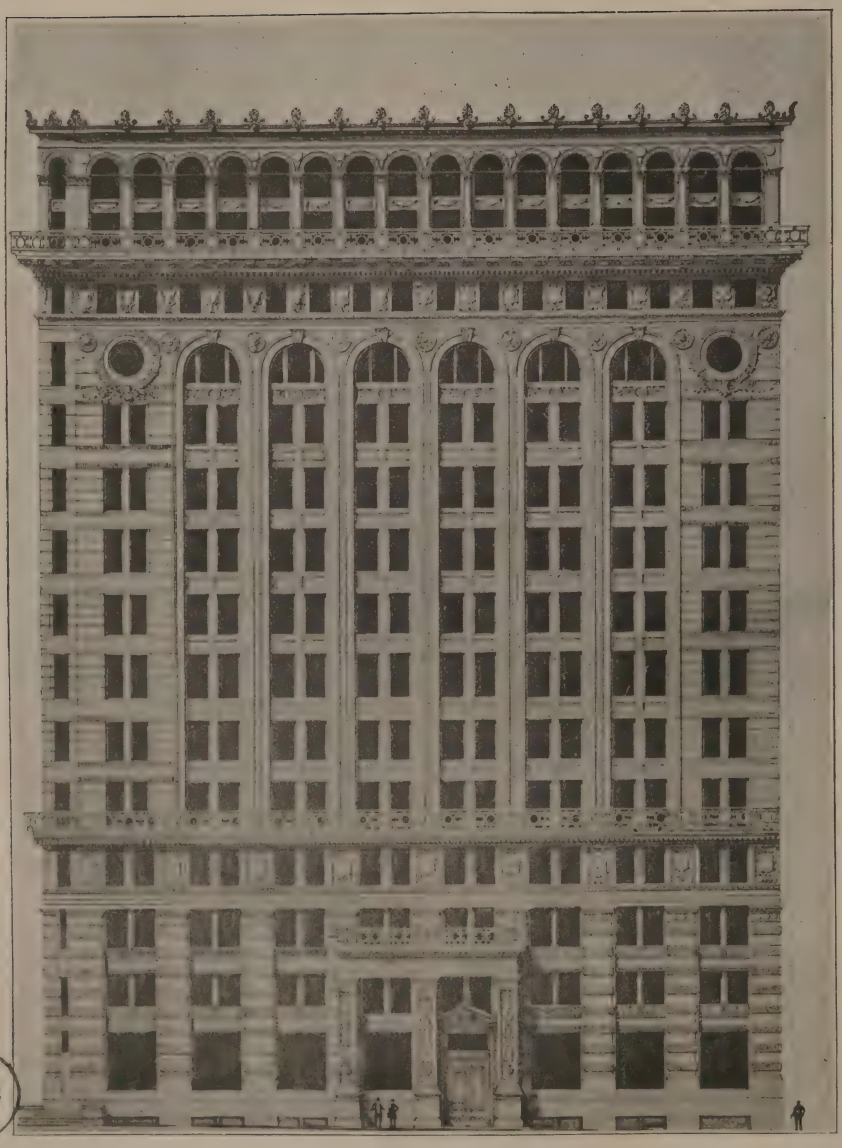
WORKS

OF

CLINTON & RUSSELL

BY

RUSSELL STURGIS



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DESIGN FOR CHESEBROUGH BUILDING.

Pearl and State Streets, New York City. Clinton & Russell Architects.

The
Architectural Record.

A REVIEW OF THE WORKS OF CLINTON & RUSSELL.

THE firm of Clinton & Russell is of later formation than most of the firms which are well known in the architects' world. Charles W. Clinton is much the older man, and studied the profession of architecture with Richard Upjohn, who gave up work in 1870. That Upjohn, father of the present Richard M. Upjohn, was the architect of Trinity Church, New York, finished in 1846. He was the first president of the American Institute of Architects, retaining his presidency until the time when, from a local society, it became an organization with chapters in different cities of the land. Mr. Clinton himself was one of the first members of the Institute of Architects, his membership dating from the first year, 1857. For some years Mr. Clinton was associated with Mr. Edward Tuckerman Potter, the firm name being Potter & Clinton.

William Hamilton Russell was born in 1856. He is a graduate of Columbia College, and studied architecture with the well known firm of Renwick & Sands, in New York, and also in Europe. Renwick & Sands were in very active business at the time Mr. Russell was connected with them. The partnership being broken by the death of Mr. Sands, in 1882, a new firm was organized, consisting of Mr. James Renwick—much the oldest man of the three,—Mr. Aspinwall and Mr. Russell, and for ten years they were actively employed. In 1892 this firm was dissolved; and for two years Mr. Russell had been alone when, in 1894, the present partnership of Clinton & Russell was formed.

It has been thought best not to discriminate in the following pages the work of either of the partners from that of the firm, or that of the other partner. It is evident that the larger office buildings are more generally the work of the firm.

The beginning of the year 1898 will see a large office building taking shape at the southern corner of Broadway and Exchange



STATUE OF PETER STUYVESANT.

J. Massey Rhind, Sculptor. Clinton & Russell, Architects.



STATUE OF HENRY HUDSON.

J. Massey Rhind, Sculptor. Clinton & Russell, Architects.



"EXCHANGE COURT."

Broadway, Exchange Pl. and New St., New York City. Clinton & Russell, Architects.

Place. This building will bear the name of Exchange Court, as the building now occupying the site does. It will fill the front from Broadway to New Street on the steep slope of Exchange Place. Half way down the hill will be the main entrance, while another entrance will be on Broadway at the southern end, and one at a similar situation in the New Street front. A view of the building, taken from the architects' drawings, is given in our first illustration. Its general scheme is that which is always most successful and most agreeable in its architectural result, for a high building—namely, that in which two pavilions are separated by a court, with the main en-

trance-way leading into and occupying that court on the ground floor. At least, no scheme has yet been devised which gives so good an opportunity for general impressiveness of the resulting structure. Delicacy of proportion seems to be out of the question; fine details are, of course, unknown to our general architectural practice, and the difficulty of applying them to a lofty building has not as yet been overcome, except in one or two instances—the work of exceptional men. But the division into two great pavilions separated by a court allows, at least, of that always fine effect of repetition, one great mass duly echoing and repeating another; and a certain large general proportion is thus attainable—namely, that between the pavilions and the court which separates them and that between the free or tower-like masses of the pavilions and the continuous basement, held together in one mass by the courtyard entrance itself. That is to say, the Exchange Court building is likely to be much finer in external effect than if it were a single great cubical mass with an unseen courtyard within. The design before us deserves no special remark except that the treatment of the two lowest stories as the architectural basement, the uprights very strongly emphasized and forming almost detached piers thirty feet high, is probably the best arrangement possible under these conditions; the piers carrying as they do a continuous string-course forming a kind of entablature, the unfortunate effect of arches in this place is avoided. It is doubtful if arches are ever altogether successful when used to close at top the openings of these lower stories. The fronts are so evidently resolvable into a series of upright piers; it is so obvious to every one that the uprights must come over each other, and that there is not and cannot be any broad wall-surface requiring an arch to support it, that even the uninstructed observer must feel the superiority of a straightforward post-and-lintel composition. Moreover, those who know anything about the steel framing of these modern office buildings, know that each one of these piers is a mere mask of one of the great metal uprights of the building; and to him, assuredly, the arch is a useless and undesirable device for darkening the windows which can ill afford to have their valuable space diminished.

In one respect this building is notable—namely, the proposed addition of sculpture of permanent value to its façade. The example of the American Surety Company, at the corner of Broadway and Pine Street, has been followed; and the same artist, Mr. J. Massey Rhind, who modelled the fine and important allegorical figures for that building, has made for this one four figures larger than life. These are portrait statues, more or less ideal, and representing Hendrick Hudson and Peter Stuyvesant, DeWitt Clinton and General Wolfe. Three of these worthies were certainly New York men. Whether General Wolfe was or not, we will leave to special students

of American history to decide. The selection of this one as the fourth figure has certainly puzzled many whose opinion is worth having. This, however, is of minor importance. The public will be satisfied if the statues are fine, as they have every reason to expect them to be. Photographs from the models are given in these pages, and it is evident that the public may be congratulated upon the statuary they are about to possess, even if there should be ground for a suspicion that the sculptor does not resolutely reject that heresy which bids the figure to be more elongated—taller and more slender —than the proportions of life, when it is to be seen from below. There will be two recumbent figures in the spandrels of the arch in the main entrance on Exchange Place, but these, and the sculpture of the pilasters and attic of this entrance exist as yet only in sketches, and no judgment of them should be passed.

Another criticism on the design seems necessary—namely, an insistance upon the need of special supports for the statues in question. The piers which carry the horizontal entablature and which form the architectural basement may be assumed to be sufficient in reveal and in apparent mass. They carry the piers of the upper division and combine well with the whole structure. If, now, four of these piers are advanced horizontally beyond the general face of the wall so as to seem very much thicker and more massive, and if the apparent cause for this is merely the placing upon them of the weight contained in a marble statue, even of heroic size, an architectural solecism seems to be committed. If it were the custom in our time to design with any reference to the purposes or nature of the structure, it would have occurred to the designer of this front that these statues require special uprights to support them, either corbels or engaged columns, or some architectural device less ponderous, less magnificent in its possibilities, less potential as a carrying member than these piers which seem to have a hundred and fifty feet of wall to support. It is to be asked, in short, that all the piers be set to the same kind of work—namely, that of carrying the superstructure, and that the statues should be carried on projecting members, of minor importance when considered as parts of the construction, however important to the design.

The beginning of the year 1898 will see, also, a nearly completed structure, by Messrs. Clinton & Russell, a few doors below Exchange Court. This is the Hudson Building, 32 Broadway. Here the same, or very similar, arrangement of piers is used for the architectural basement, which, however, in this case consists of three stories, the building itself being higher, or sixteen stories in all. The basement piers themselves, because including three stories in their height, are treated with a little more elaboration. Each one consists of a decided and well-marked pilaster backed by a plain pier



HUDSON BUILDING.

32 and 34 Broadway, New York City. Clinton & Russell, Architects.

without architectural features. As in the case of Exchange Court, the doorway on Broadway is arranged between two of these piers with its architrave and fronton, and is set upon the face of these piers and projecting from them. It is, of course, an anomaly to treat pilasters in this way, but the generality of the practice and the recognized fact that the lofty pilasters are not monoliths, but themselves built-up piers, makes it difficult to object very strongly to the solecism in question. More objectionable is the insertion in the otherwise simple fronts of two horizontal stripes with a good deal of sculptured ornament in them, each stripe having the width of one story. Such a method of breaking up a lofty front is feeble, and seems the first suggestion that occurs to the puzzled designer without adequate resources. The value of this façade is in its rigid severity, its extreme plainness. That severity, that plainness is the condition to which one would like to reduce all these business fronts until the artists suffering from the absence of something artistic in their exteriors begin to work out a scheme for their fitting adornment. The plainer the better! should be the primary requirement of every owner in giving instructions to his architect, and the primary maxim of every architect in giving directions to his subordinates. In this respect the Hudson Building is one of the best fronts in the business quarter of the city; its cornice of very slight projection is also an excellent feature, and it would be better still if the little arabesques of the fourth and fifteenth stories could be abolished.

In both these cases, the new high building stands close against a previously existing building, higher or nearly as high. The Exchange Court blocks out the windows in the northern wall of the old "Tower Building," and the Hudson Building, in like manner, stops up the side windows of the great structure of the Standard Oil Company. A year or two of experience will show how far these high buildings are of business value when they cannot open side windows over their neighbors' property. It has been stated rather frequently in the newspaper press and elsewhere that these sky-scrapers are only economically valuable when they are isolated. That is to say, one sky-scraper is good, but two, close together, defeat each other's purpose; and, of three in juxtaposition, the middle one is a pecuniary failure. That remains to be seen, and it is an interesting question.

Meritorious in the way of extreme plainness is the twelve-story building in Murray Street, Nos. 9-15. This, which is called the Franklin Building, contains more careful, or, at least, more judicious designing than either of those hitherto spoken of. The device, not seldom employed in these unmanageable high fronts—namely, that of making corner piers of apparent massiveness by reducing the outermost vertical row of windows to openings much smaller than those



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FRANKLIN BUILDING.

Nos. 9 to 15 Murray Street, New York City. Clinton & Russell, Architects.

of the rest of the front, so that the two piers with a little window between them come to seem like a single massive pier with openings in it too small to affect the appearance of weight,—this device is well used in the present instance. This is always fortunate in architectural effect. It carries with it, of course, the necessity of diminished light in the offices which occupy the corner; and this, which is of no consequence in a building with three sides free, may be more or less objectionable where other buildings prevent the opening of windows in the side walls. Whether this arrangement is admissible will be a question for each separate designer; that it is effective there can be no doubt. In the case before us the treatment of the whole building up to the main cornice, which is treated as a balcony, is very effective. The grouping of seven super-imposed couples of windows into one round-headed window, as in Exchange Court, and the meaningless breaking up of an otherwise uniform front by string courses, as in the Hudson Building, are avoided. The windows are naturally placed, and a really pleasing system of fenestration is obtained in the simplest way. It is not so easy to approve the very high attic, two stories made into one by means of lofty pilasters. There will be occasion to comment unfavorably upon a similar feature used in other buildings, where, indeed, it is far more unpleasant than it is here. Indeed, this front is one of the best which the lofty architecture has yet brought into being. That is not to give it very warm praise. Is there any single high business building in New York to which warm praise should be given?

Three buildings put up for one and the same proprietor—namely, the Woodbridge Building, at William, John and Platt Streets; the Graham Building, at Duane and Church Streets, and the Stokes Building, No. 47 Cedar Street, demand attention as having that plainness which seems so eminently desirable. The Woodbridge Building, twelve stories high, fronts on three streets. It has its main doorway in the middle of the principal front; it has a high architectural basement, a narrow and low mezzanine between two marked string courses, and a seven-story wall divided into large piers, a low separate story below the cornice and the attic above the cornice. That is to say, it is designed in a perfectly simple and natural manner, as well fitted to its purpose as any scheme that can be devised. What is to be objected to is the arching of the window-heads in four stories, so that valuable light is sacrificed and windows of an ungainly shape are produced. Nothing can prevent the windows of the third story and those of the eleventh story from seeming lower than the windows in other stories, while the broad openings of the tenth story become mere lunettes. It is difficult to have patience with the repetition of this mistaken detail. The arches have no weight to carry. It is hard even to give them any apparent weight



GRAHAM BUILDING.

Duane and Church Streets, New York City. Clinton & Russell, Architects.

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THE WOODBRIDGE BUILDING.

William, John and Platt Streets, New York City. Clinton & Russell, Architects.

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THE STOKES BUILDING.

47 Cedar Street, New York City. Clinton & Russell, Architects.

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which they might seem to carry. They serve no purpose in the world but that of alternating round-headed openings with square ones, and so avoiding a certain monotony. But monotony is precisely the one feature upon which these designs must depend if they are ever to be made successful. Monotony is not in itself an evil in architecture. Every designer must have felt a longing for long rows of openings of the same size, and must have felt the charm of them when they occur. Where would the interior beauty of basilicas and of cathedrals be but for the long sequence of equal or nearly equal arches? The sequence of equal or nearly equal stories superimposed one upon another is, indeed, an annoying thing at first sight, and the architects have shrunk from it, but an acceptance of the monotony of these many stories, which have precisely the same purpose, and, therefore, the same or nearly the same dimensions, is a condition precedent in the study of these designs, and we are more ready to welcome a frequent acceptance of it even if the result seems cold and hard than the efforts to escape it which involve the use of arched openings interspersed with square-headed ones without any logical reason for their appearance there. In this respect the Graham Building offers a good illustration and makes an agreeable contrast to the last-named one. In this there are, indeed, some arches, and the third story and the eleventh story are open to the same charge that we have brought against the stories of small round-headed windows in the Woodbridge Building; but the Graham Building, with its large piers forming an architectural basement of two stories, and with the plain square windows with flat brick arches in the narrower front and in the outermost vertical rows of the broader front, shows how much may be done by a frank acceptance of monotony. The observer wonders why these square double windows could not have begun immediately with the third story and have gone on uninterruptedly to the eleventh story and to the cornice. Even a plain brick wall is often a beautiful object, and a brick wall pierced with openings having flat arches like these, the bricks used being as fine as these are in their play of mingled color, is one of the most beautiful things in architecture. Why our designers will not work frankly and joyfully in masses of brick, accepting constant repetition of the same form as a necessary and not undelightful feature, is more than the student of their work is able to say. Such a student longs to see it tried more frankly—more boldly; the small and feeble attempts at it which have been made, as in the Graham Building, encouraging him to expect fine things of it when it is undertaken without reserve or hesitation.

The Stokes Building, No. 47 Cedar Street, as first built and as shown in our illustration, was free from the second attic which now finishes its façade in a rather odd and abnormal fashion. The ten-story



RHINELANDER BUILDING.

Rose and Duane Streets, New York City. Clinton & Russell, Architects.

BOSTON PUBLIC

front, as first conceived, is all of brickwork, except the architectural basement of two stories, and differs very slightly in style from the Graham Building. The broader façade of this last-named building is preferable, we think, to that of the Stokes Building, for reasons already suggested in this paper, such as the difference between the windows at the corner and those in the middle part of the wall, and the variety of proportion which results from them. In spite of this, however, the front of the Stokes Building is very agreeable, whether as seen from the narrow street, as it must be seen usually, or as in the photograph which was made by taking advantage of the temporary disappearance of its opposite neighbor. Yes, the Graham Building must be considered the best, on the whole; similar as the three entrance fronts of the three buildings really are, there must be a preference, and that preference it is not hard to give to the building at Duane and Church Streets.

There is one building in a rather out of the way situation which is a good instance of the right use of brick work. This is the Rhinelander office building, fronting on Duane and Rose Streets. It is one of those large, lofty, plain warehouse buildings which really adorn the streets of business New York in those quarters where elegance and ladylike shopping influence are not felt. Persons who do not visit the quarter east of City Hall Park may see in the De Vinne Building, at Lafayette Place and 4th Street, the type and, perhaps, the prototype, of these warehouses, although in that building the doorpiece has a refined elaboration not common to the others. One is not likely to be enthusiastic over the rustication in the second, third and fourth stories of the Rhinelander Building; that seems a perpetuation in brick work of what was but a stupid attempt at ornamentation in the original coursed stone work. It was assuredly the duller workmen of the later revived classic who invented rustication; the fellows who did not know how to introduce any variety into their buildings, who dared not employ ornament and yet felt the need of breaking up their oppressive flat walls. Good American brickwork need not resort to any such wretched devices for the sake of variety; at least, need not do so when there is no compulsion put upon the architect to use face-brick. Granted that the smooth, uniform "Philadelphia brick" of fifty years ago required some introduction in the lines of light and shadow, assuredly this is not the case with the mottled and variegated brick work used in this building, and always to be had at a much lower price than was paid for the uniform-colored face-brick before alluded to. The lines drawn horizontally through the ground story by means of raised bands of terra cotta with a broken fret in relief upon their surface, are excellent. They help to give to this lowermost story a certain flat-bedded solidity of appearance; they look like bond-stones where they show on the surface of the piers

which form this story, and greatly aid in the general effect of the building. In like manner, the simulation of an entablature at the top of this ground story made by a group of moldings with leaf ornaments below, and a second and larger group with egg-and-dart ovolo and a kind of wave ornament above it on the face of the square cornice-like terminal moulding—all this detail is very much in place. This seeming entablature is carried over the large openings of the ground story, forming lintels, at least in the architectural sense; and in these lintels the courses of brick still run horizontal, disclaiming in this way any constructional feature in the brick facing, and insisting upon the iron girder behind. The repetition of small string courses above the fourth story and again in two or three places near the top of the building, is very well managed. The cornice is too big for a building in a narrow, crowded street; we must go back to the Hudson Building above named to see the business cornice as it should be. Here, again, in this Rhinelander Building the round-arched windows are used in a way to avoid ugly contrast with the square windows. The windows with round arches are inserted in piers at the corners managed in the way which was described above in treating of the Franklin Building. These round-headed windows are, then, not contrasted with the square windows in such a way as to make the whole story seem unduly low and insufficiently lighted. The windows which look smaller because of the lowering effect of their arched heads come where the small windows are effective, and help the design in a way which larger ones would not do. The porch at the angle of this building, and which forms its principal entrance, built entirely in Catskill Mountain bluestone, with the exception of the polished granite shafts, is effective in design, and the contrast of the bluestone with the large mass of brickwork is all that could be wished. In short, while this building cannot claim any great novelty of design, the result is effective and good, as good as anything that one finds in comparing the plainer and less costly of the business buildings in New York.

Another Rhinelander Building stands on William Street and forms Nos. 232-238. The design of this façade is very like that of the two fronts on Duane and Rose Streets, a similar arrangement of coupled windows between piers, small round windows in the corner piers, rusticated brick-work below, and bands of terra cotta on the ground story, which forms the architectural basement. It is a simple and really imposing front. It is a singular comment, however, on the architectural pretensions of such fronts as this, that the gable wall, as shown in our illustration (for it is not exactly like this in reality) is a more interesting composition than the façade on William Street. Unquestionably a part of this interest is found in the very large masses of unbroken brickwork which, of course, cannot be ob-



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RHINELANDER BUILDING.

232 to 238 William Street, New York City. Clinton & Russell, Architects.



FAHYS BUILDING.

54 Maiden Lane, New York City. Clinton & Russell, Architects.

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tained in a street façade where the demand must always be to get as much light as may be feasible. Still the fact that the value of this pictured gable-wall is found in the vigorous contrast between the centre broken up by many windows and the large piers which enclose it; together with the upper stories with many windows and the lower stories with but few; suffices to make a point well worthy the attention of every designer. Boldness, dash, some freedom in the general design, and some indifference as to the arrangements of solids and openings, which have been at once consecrated and vulgarized by long use; these, as this gable wall stands to show us, are what are needed for the designing of our high business buildings. Still, these huge brick warehouses are among the most successful



ENTRANCE OF FAHYS BUILDING.
54 Maiden Lane, New York City. Clinton & Russell, Architects.

architectural novelties in New York, their great scale counting for much in their merit.

A great contrast to the simplicity of the Rhinelander warehouses is found in the attempted richness of the Fahys Building, at No. 41 Maiden Lane, going through to Liberty Street. Each of the fronts, twelve stories high, is decorated below with an elaborate screen of carved stone-work, carefully studied from French Renaissance work of the sixteenth century. The screen forms the façade for two stories of its height. A similar detail, also of Renaissance architecture, forms the topmost story and the parapet. All between—nine stories

of wall—is pierced with windows of generally uniform character and disposition, some having segmental arches of very slight rise, others having perfectly flat arches, but all the windows of the same size and arranged in couples in a perfectly simple, natural and obvious way. In fact, the spacing of the windows is equally simple throughout, and the ornamental screen at the bottom and the ornamental attic at the top are not allowed to interfere with this simplicity and utilitarian disposition. All this is good. The windows are where they ought to be, the undecorated brick wall is altogether right in its treatment, the Renaissance architecture of the screen is nowise bad, being, indeed, a very frank study of excellent models, and the larger openings of the ground story grouping well with the small ones of the story above. It was an excellent thought to add to the pedestals of the lower pilasters striking blocks of polished granite.

So far we have described a front worthy of praise. One obvious peculiarity it has which is not so agreeable. What has been called the decorative screen at the base of the building is advanced a little beyond the rest of the wall and invites description as a screen; that is to say, as a structure not needed for carrying the great mass of wall above. On the other hand, it is in reality an architectural basement to the wall above. The piers and lintel-courses of the ground story and the one immediately above it are decorated with pilasters, candelabrum pillars, sculptured panels and pierced parapets chosen from good Renaissance architecture. This elaborate piece of decoration is not a screen, and the fact that it seems so is the fact upon which the critic must insist. It is not an unnatural or an objectionable attempt, this, of decorating the lower stories of a very high building, because these lower stories are the only ones which can be seen by the passer-by in the street; and to decorate in a similar manner the upper story because that is the one seen from afar. It need hardly be pointed out, however, that very great caution is necessary in undertaking the elaborate enrichment of three stories out of twelve in a flat, street façade. Probably, the problem of the lower stories could be solved by making such a decorative front really a screen—that is to say, by giving it such considerable projection from the face of the main wall that it would be at once recognized as an added piece of ornamentation. This, however, is impracticable in our cities because the owner of rentable property would not consent to the setting back of the wall-front of his building to allow of it without encroaching on the street.

A somewhat similar effect is attempted, and with good success, in the Samson Building, Nos. 63 and 65 Wall Street. In this the two lowest stories form an architectural basement, and are quite elaborately worked in the style of the French Renaissance; the third story is made into a mezzanine with pilasters carried on corbels and carry-



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SAMSON BUILDING.

Wall Street, New York City. Clinton & Russell, Architects.



UPPER STORIES OF THE SAMSON BUILDING.
Wall Street. Clinton & Russell, Architects.

ing in their turn pedestal blocks of an elaborate balustrade. There is, then, in this twelve-story building a much larger part of its front occupied by the architectural enrichment of the lower members than in the building last above named. The face of the main part of the wall, too, is broken up into great piers between which the coupled windows are recessed, and the topmost story is adorned with a Renaissance order of coupled pilasters carried on most elaborately sculptured corbels, and carrying in their turn an enriched balustrade with high pinnacles which come against the sky. In short, this façade is not only much more richly decorated than the Maiden Lane front, but it is also better proportioned in the way in which the enrichments

are applied to the front. The relations between the enriched and the plainer parts are better maintained. It is not to be denied that it was easier here because more elaboration was allowed. The front is more costly per square foot. It is an advance on the Maiden Lane front named above, and will serve as a good model to study when a further advance in enrichment is desired. This building has also another feature which will commend it to students of this puzzling sky-scraper problem, and this is the adornment of the gable walls. The structure is, indeed, only twelve stories high, but a comparison of this with the very few other buildings in which the gable walls are treated architecturally will show the student that the conditions do not differ greatly between one and another building which rises high above its neighbors. In this case, the relief of the gable wall above Brown Brothers' building on the west is of four stories, and the relief above the lower building on the east is of six stories. These gable walls are then treated with a continuation of the enriched attic already described as terminating the façade. The enrichment is not carried the whole length of the gable; a convenient break allows the system of coupled pilasters with enriched windows between them, and the elaborate and effective balustrade and pinnacles to stop, without undue abruptness, about thirty feet from the street front.

The Mechanics' Bank Building, at 33 Wall Street, is an attempt at an enriched Romanesque front. This was built some twelve or thirteen years ago. Its proportions are peculiar. The nine-story front, not very wide, is divided into five compartments rather singularly contrasted. Opinions will differ as to the merit of the front in this matter of proportion. Calling the largest compartment A, the second B, etc., and starting from the sidewalk, the architectural stories succeed one another thus: B C A D E, E being, of course, the attic. So far, there is nothing unusual. A, the largest part, comes naturally above B, the architectural basement, and C, the mezzanine. The peculiarity is in this, that A is very small as compared with B and C, and this peculiarity is one that it is very hard to accustom one's self to. It cannot but be thought that a more decided variety in the proportion would aid the building greatly. In this front, also, was used disagreeable alternation of round-arched and square-headed openings, upon which there has been comment already. There is so much that is good about this façade, the details are so carefully considered, the sculpture has been so elaborately modelled and thoughtfully fitted to its place, the appearance of stony massiveness given to the piers and arches so agreeable, that one lingers over the front in hopes of finding it more satisfactory on further examination. It is, however, disappointing on the whole, nor can any amount of study reconcile one to its general awkwardness of grouping.

A much better piece of proportion is that shown in the Wilks



WILKS BUILDING.
Southwest corner Wall and Broad Sts., New York City. Clinton & Russell, Architects.

Building, at the western corner of Wall and Broad Streets. Here, also, round-arched and square-headed openings alternate, and it is very hard not to be vexed by that arrangement, but the division of the wall of this building vertically into three nearly equal parts crowned by a mansard roof so steep that it is practically a continuation of the wall, results in a proportion far more subtle and far more agreeable than these down-town buildings generally achieve. This is a very satisfactory exterior, as business buildings go. The rounded corner is insisted on too strongly. The carrying up of that quarter circle of the plan from the sidewalk to the crown of the roof, involving as it does the curving of two great string courses and the cornice

and a similar curving of two dormer windows, one above the other, and even of a bullseye in the roof above, is irritating. The student longs to see something contradict that long continued circular curve. It suggests inevitably the idea that the front was originally a single flat surface and was bent around a rod to bring it into its present shape, and it is not to be doubted that square-fronted dormers on the corner would improve it greatly. The boldly projecting, sharp-angled chimneys, relieving themselves gradually from the roof as it ascends on its slightly marked inward slope, aid the whole composition very much, and confirm the impression given above that a slight additional insistence on angularity at the top of the building would benefit the whole. This building is as free from ornamentation of any sort as the Mechanics' Bank is rich. Sculpture is good, but sculpture on Wall Street buildings interests no one, for there is no one there with a mind open to such impressions, and the sharp-edged severity of the Wilks Building is certainly preferable.

The Bank of America, in Wall Street, at the northwest corner of William, is as free from sculptured ornament as the Wilks Building. It is, however, in decided contrast with that structure, because while the Wilks Building is extremely smooth and delicately worked, with shallow mouldings and sharp arrises, the bank is built of rock-faced sandstone, and in this way affects a kind of rusticity which is more agreeable in a one-story country house than in a Wall Street business building nine stories high. This facing with undressed ashlar has been very much overdone. It is fortunate, indeed, that the business quarter of the city has not many buildings of this sort. Every one of them is, from the mere fact of its rough surface, somewhat of a blot on the street, which street, if it cannot be beautiful in its architecture, may, at least, have that which is delicate and finely worked. Apart from this feature, the building in question is proportioned in its height—in the vertical arrangement of its parts one above the other—quite like that of the Mechanics' Bank. There is the same architectural basement of two stories; the same mezzanine, also of two stories, and, therefore, unusually large in proportion to the whole front; the same main wall above, with only three stories in it, and, therefore, not quite as much the central feature as one seems to expect it to be, and there are the same two smaller stories above. It is a proportion that one cannot get to care for, probably because it is a proportion between parts too nearly equal, and because none of the treatment of these fronts is compatible with such refinements as that. The proportion between the span of arches in a Byzantine palace front in Venice may be differentiated by half inches only, and be lovely; but the conditions here are very different.

The Continental Insurance Company has a building at No. 46 Cedar Street, the basement of which is a model for these classical



BANK OF AMERICA.

Wall Street, New York City. Clinton & Russell, Architects.

fronts. Like several of the buildings described above, this basement comprises two stories of offices, and, like them, it consists exclusively of separate piers treated as pilasters. What is exceptionally fine in the present instance is the porch with columns of a free Roman Doric, forming one order with the pilasters of the story itself.

The most extensive and elaborate business building erected by this firm, or its members, is the home office of the Mutual Life Insurance Company; the large building fronting on Nassau, Cedar and Liberty Streets. It is very unusual, in a structure erected for renting purposes in our crowded Wall Street quarter, to see so much projection and receding as is here allowed for the pavilions on Nassau Street



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CONTINENTAL LIFE INSURANCE CO.'S BUILDING.

46 Cedar Street, New York City. Clinton & Russell, Architects.



MUTUAL LIFE INSURANCE COMPANY'S HEADQUARTERS.
Nassau Street, New York City. Clinton & Russell, Architects.

and the curtain wall between them. Obviously this recess is made to allow the porch to stand where it does with some decided projection beyond the wall in which the main doorways are pierced. The porch, in itself two stories high and very dashingly treated, is not the better for being planted in such a recess; and yet the general effect as one looks up street from the Cedar Street corner, or southeastward from the Liberty Street corner, is very good, and the better for being so unusual. The porch is seen in comparison with the broader and higher mass formed by the pavilions next beyond it. It is as if the pavilion which the spectator sees at the corner farthest from him

were echoed by the porch, and yet the porch itself, being larger in its parts and richer in decoration, holds its own perfectly and asserts itself as the central feature. The building on Nassau Street is nine stories high, and, as originally built, this structure had only five bays on Liberty Street in addition to the corner bay, with its curvilinear



CORRIDOR, MUTUAL LIFE BUILDING.
Clinton & Russell, Architects.

plan. The structure further to the eastward and rising high above the roof of the Nassau Street building is of much later date. The extreme difficulty of managing this lofty and towerlike mass, rising high above the attic story, which is uniform with the attic elsewhere, must be clear to everyone, and it is as well managed in this instance as we are ever likely to see it. The question is whether it was wise

to carry the attic through in that fashion and to dwell so strongly upon a horizontal feature which binds the whole building together when it must be loaded down with the huge superincumbent mass.

The courtyard, as one sees it from the windows which look upon it, is one of the most interesting of the great inward-looking compositions which these enormous office buildings present. Let the reader enter that doorway on Liberty Street, in the newer and highest part of the building, and look through the windows of the stairway tower, and he will see a really striking group of fronts. If the architects were encouraged to treat these courtyards artistically! That,



UPPER STORIES OF MUTUAL LIFE INSURANCE COMPANY'S BUILDING.
Nassau Street, New York City. Clinton & Russell, Architects.

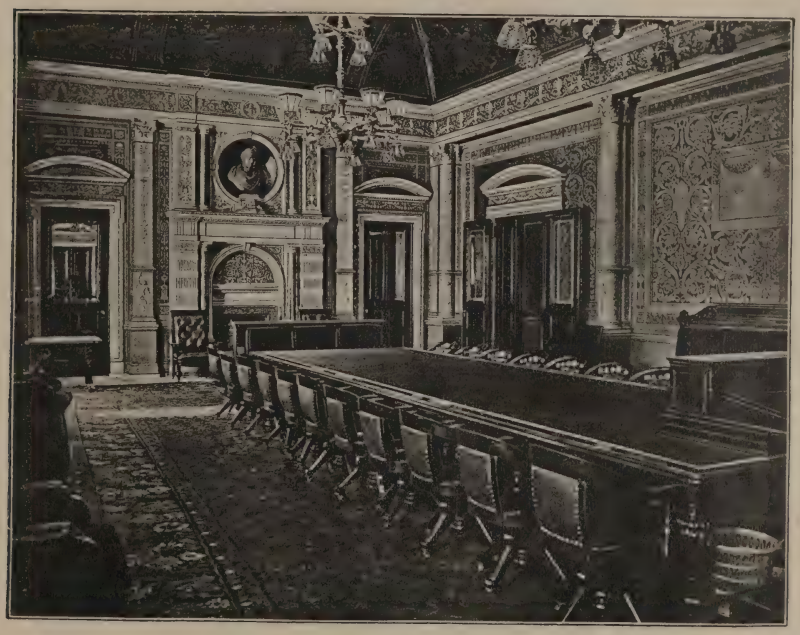
however, is out of the question, and returning to the exterior, it is more agreeable to consider only the original building which exhibits a more purposeful and intelligent effort to enrich a business building than can be found in the design of any down-town building which suggests itself to the memory. It is not meant that this is altogether the best of our down-town business buildings, though it comes very near to being that. It is the use of the architectural enrichment by the great order of pilasters coming above the simpler orders below, and especially the architectural sculpture which has been freely added, which makes this exterior remarkable. This opportunity for praise would seem, however, to stop at the cornice. The attic is less fortunate.



APPROACH TO ELEVATORS, MUTUAL LIFE INSURANCE COMPANY'S BUILDING.
Nassau Street, New York City. Clinton & Russell, Architects.

Taking the façades, eight stories high from the sidewalk to the main cornice, it is noticeable that the feature which we have objected to in other buildings by this firm is to be seen here also—namely, the great height of the mezzanine in comparison with the architectural basement. Here, indeed, they are very nearly of the same size. It may be that this very fact of their being almost exactly alike and contrasted strongly with the much greater and loftier members of the principal architectural story, saves the situation; or it may be that the eye insensibly makes an architectural basement of the two lowest members—that is, of the four lowest stories—taking together those parts where the plainer work is and the orders into which no sculpture enters. It may be that the very fact that the two-

story porch corresponds exactly in height with this four-storied, two-membered lower half of the structure, confirms this general impression that the basement, architecturally speaking, is four stories high. However that may be, the student is not offended by the lack of undue variety of proportion, and finds it natural and simple to take the lower mass together and to welcome the superimposition of the four-story principal mass with the colossal order of pilasters. Yes, this is, on the whole, a successful piece of decorated architecture, once



THE "BOARD ROOM," MUTUAL LIFE INSURANCE COMPANY'S BUILDING.
Nassau Street, New York City. Clinton & Russell, Architects.

the scholastic and academic principle of never doing what has never been done before, is accepted as final.

It need hardly be said that there is little room for real enjoyment of a work of art in our study of these buildings erected for the purposes of business enterprise. In previously published studies of the work of contemporary architects, it has been pointed out and insisted on quite sufficiently that there is no chance for fine designing in buildings which are built primarily for profit, and which are built in headlong haste that not one week's rental may be lost. These are not the conditions under which a work of art is produced. Fine art requires for its development tranquillity, time enough and the opportunity to enjoy what the artist is doing. Of these requirements, tranquillity is not possible to the hurried business man whom we call an architect, overwhelmed with the duties of superintendence, of



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STEVENS BUILDING.

Maiden Lane, New York City. Clinton & Russell, Architects.

negotiations with his employers and the contractors who are, in a sense, his employees, and with the administration of an office-full of subordinates. Active business of a fiduciary nature, involving the expenditure of large sums of other people's money on which a brokerage is charged, is not compatible with fine designing. In like manner the second requirement, time enough, is as impossible. There is never time enough. The actual building must be hurried through in the fewest possible days. From the moment when the rents in the old edifice cease to the day when those charged for the new and more sumptuous offices begin, there must intervene as few idle weeks or days as the necessary conditions of bolting iron together and piling stone upon stone will admit of. No opportunity of careful consideration of details and of those invaluable amendments to the design which suggest themselves as the work goes forward, can be allowed. Nor would this be so bad, so hopeless, were it customary to give the architect any chance to think of a design in advance; but notoriously this is almost never the case. The architect is employed to make a design almost at the same headlong speed that he is required to carry it out after it is accepted and the old building is removed. Why this is so, unless it be because it is in human nature to put off the evil day and the necessary moment of reaching a decision as long as possible, it is, perhaps, impossible to say. Every architect is familiar with it, however, and knows that for a country house the design is generally asked for about the time when the frost is out of the ground and the excavation of the cellar should be begun, and for a city business building the design is asked for about the time that the mechanics should rightly be invited to come and see the drawings and specifications, and put in their estimates for the work. This is so generally the case that in the few instances in which, by some accident, there has been delay and the architect has more time at his disposal, he hardly knows how to employ it. His drawings were made in a few weeks, as it was required they should be; and when they were finished and he found there would be unexpected delay and he might, if he chose, think the design over, the drawings were already approved and decided on, and it would be contrary to all business principles to open up the question once more and reconsider that which had been already decided as final, with as much consideration as is customary to allow in such cases. As to enjoyment of the work, our third requirement, there is a certain pleasure in carrying out a large and costly building, and in seeing that the parts of it go rightly into place, and that the whole is well and thoroughly realized according to the original conception. But all this is generally quite apart from any artistic enjoyment. In this we are brought face to face with that curious consideration which can never be too much insisted on, because in it are found the

reasons for the unsatisfactory state of our should-be artistic building. This profession of architecture alone, among all professions, can be practiced with perfect integrity, respectability and honor without any success at all in that one branch of it which many persons suppose to be almost the whole thing—namely, the artistic side of it all. It is notorious that many of the architects of the highest standing in the community, and those who deserve to stand among the highest, are without the artistic sense, and disregard wholly that part of the work. It is equally notorious that many an architect who thinks his work of some merit, thinks so only because of his complete ignorance of what really fine and artistic designing is. We have to admit that this or that architect, in a very large way of business, trusted by those who employ him to such an extent that they give him all their work as fast as it comes along, and are entirely satisfied that this professional advisor should continue in their confidence and in the administration of their great affairs—that such an architect produces absolutely nothing which can be called, in any sense of the word, artistic. Not even by accident when he has a small chapel, a family tomb, a public decorated monument to produce—not even under these exceptionally favorable circumstances does his work rise above the merest mediocrity in all that makes architecture a fine art. And yet it must be repeated, this man is cited, and to be cited, on all occasions and under all circumstances, as a wholly trustworthy, honorable and intelligent architect, doing all that his customers demand of him and pursuing his career with the right to be satisfied with every step of it. Such a man will spend ten million dollars a year of others' money, not only without giving cause of complaint, but with constantly renewed reasons why his clients should have confidence in him and should push his interests in all directions as those of the most trustworthy of professional advisors. The fact that never under any circumstances is there any flash of inspiration in his work—that, in other words, there is no instance in the whole course of it of any artistic creativeness, or artistic adaptability, such as is seen in the most unimportant work of painter or sculptor of worth—in the smallest painting or portrait-bust—is the extraordinary thing. The community does not recognize the amazing character of this anomaly because the community is so accustomed to constant reiteration of dull, unformed, uncared for, unloved designs for large and costly buildings. The community does not know that these are not architecture at all, in the sense in which a ten thousand dollar chapel may be made a work of art if the architect has lived his life as an artistic designer and cares for the design now required of him.

There are buildings in the upper part of New York, in that region which was a "residence quarter" not so long ago, and is only gradually becoming a mere business centre, which are very like in ap-



BLACK, STARR AND FROST'S BUILDING.

Fifth Avenue and 39th Street, New York City. Clinton & Russell, Architects.

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pearance to the office buildings of down-town. Few of them, however, are as high as the sky-scrapers. The building just erected at the corner of Fifth Avenue and 39th Street, and to be occupied by the firm of Black, Starr & Frost, provides a store for fashionable buyers on the ground floor and an extension of the same store on the mezzanine above, the two stories together forming the architectural basement, while above these are four stories in the wall and an attic one story high above a cornice balcony. The parts are not badly proportioned, one to another. The windows of the mezzanine story are really well managed, with remarkable ingenuity, so as to give a little wall space where light is not needed—namely, at the corner of the building, with windows as wide as those of the ground story between those broader piers. Two stories together, in which we may assume that the store for silverware and jewelry and the like is to find its necessary space, are so managed that the whole of the lower part of the building is opened up into windows while yet there is no undue sense of feebleness. The building is not necessarily built with a steel cage. It may, or may not, be so constructed—we are looking at the exterior alone. There is nothing to prevent masonry walls from doing their work, and iron columns are not needed except to divide the building in its length by a screen of supports. The proportions of the balcony cornice and the attic fit well with the general structure. In the absence of unnecessary and misunderstood details and the general seemliness of proportion, the building is successful.

The Imperial Building, Montreal, Canada, is an addition of three stories to an old building of three stories. As the old building possessed a pseudo-Grecian Doric porch, with an Ionic loggia above it, the addition finishes the group by a Corinthian loggia of much more elaborate adornment. Some sculptured ornament is added to the building in the frieze of the main cornice and in the chimneys.

The building of the New York Athletic Club, on Sixth Avenue, at the corner of 55th Street, is only five stories high, and would be known from an office building by the small windows of the ground story. In fact, the designer has seized one of the rare opportunities afforded the modern workman of securing that feature which we all love in the palaces of the old world—a tolerably solid and unbroken basement. The whole of this building is in dark red brick and terra cotta, much of the brick being elaborately molded and running over the line which separates brick, technically so called, from terra cotta, in the usual acceptation of the term. It is an unusual treatment of such a building that the gigantic windows made up of the windows of four stories should be worked into the corner pavilions, while the curtain walls between them are filled with detached windows of ordinary size evenly spaced. It is a feature which one who dislikes it

cannot grow accustomed to, however—this same grouping of many windows in many superimposed stories into the semblance of one great one. The walls between the corner pavilions are divided into simple piers fronted by flat pilasters of brick and flat string courses broken only by simple moldings; the walls in which the windows are simply square-headed openings, having transoms where they are high and mullions where they are wide. These are the parts of the building which commend themselves the most to the realistic critic. The windows on the street front, however, where arched heads form lunettes in the upper story, and where these lunettes are separated from the square windows between the pilasters below by a string course more elaborate than the rest, adorned with festoons in terra cotta; these windows are the prettiest thing about the exterior, and they are rightly made into a sort of decorative feature. This façade, although on the narrower street, is really the entrance front, and is better for some additional adornment. The entrance doorway itself, crowded for reasons of interior convenience far away to the western angle of the building, is well managed, forming as it does the basement story of one of the corner pavilions. The cornice and roof parapet, all of the same dark red baked clay, are well proportioned to the rest of the building and the broad frieze which occupies the greater part of the height of the semi-classical cornice is well proportioned to all the details near it and to the overhang of the cornice itself. There is, indeed, much to praise and much to be well contented with in this building, and, highest test of all, one could live opposite to it and not be too much distressed by its neighborhood. The mischief of terra cotta molded or cast sculpture is, of course, its mechanical look and the sense which every one has that it is producible in infinite quantities without the slightest modification or change in any detail. The way to avoid this appearance is not to challenge attention to the sculpture at all, but to let it pass as a relieving of the surface by the play of light and shade on something more agreeably diversified than the mere alternation of flutes or of reeds and ridges. Fluting has its place, and it is an ingenious piece of the decoration in this instance that the uppermost string course—that one at the base of the lunettes in the fifth story—is decorated mainly by vertical flutings contradicting boldly the horizontal lines of the molding itself. Still, however, the actual foliage and the scroll work, which occupy so much of the wall surface, are well in place, and, while inviting no particular attention to their Greco-Roman gracefulness, help the building to become festive and homelike at once, which is, of course, what a club-house ought to be.

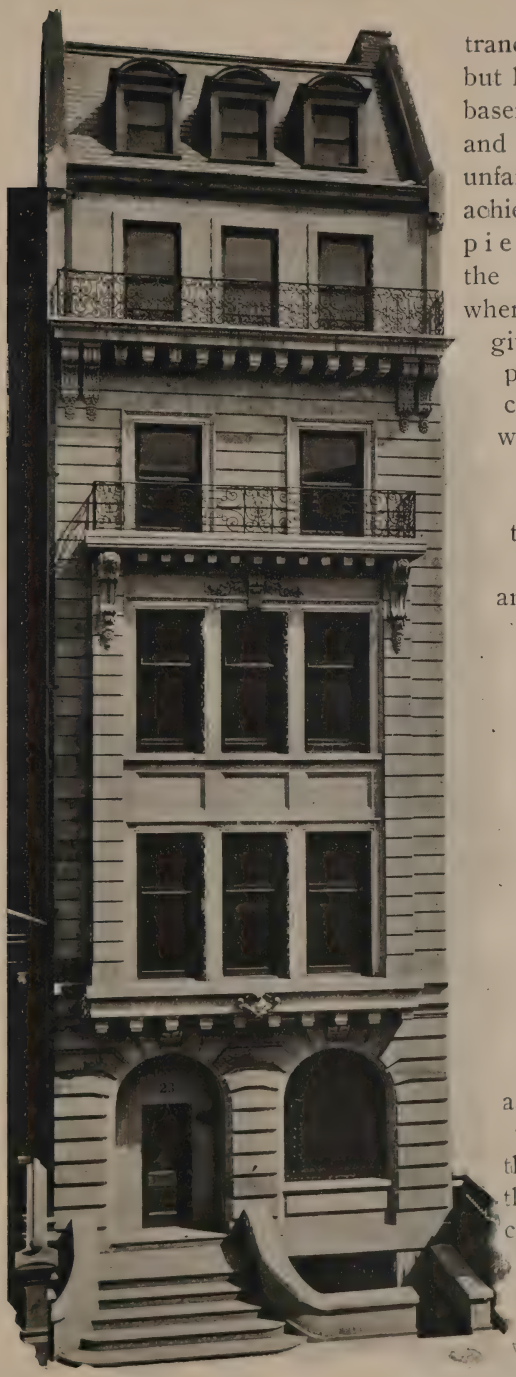
From a club-house to a large private house is but a small step, and the dwelling at the corner of Fifth Avenue and 65th Street is a cubical mass not very different in its dispositions and not very much

smaller than the Athletic Club. It is, however, very much more simple. The severe plainness, which seems to be the special virtue of the business buildings erected by this firm, is preserved in this residence. All the lower part—that is to say, the whole of the architectural basement, composed of two stories—is faced with brown freestone, while all the upper part is of simple brickwork, with window-trims of the same freestone. The entrance doorway is on Fifth Avenue, and is framed by a simple portico of two Ionic columns. On 65th Street is what seems to be a porte-cochère for the stables. The whole makes a dignified and sumptuous residence, and one whose exterior will always gratify such persons as still retain the old feeling avowed by so many worthy citizens a few years ago—the feeling against ornamentation of all sorts as being, in an undescribed sense, unworthy of sedate and dignified people.

A great contrast to this building is the house No. 881 Fifth Avenue. The impression that this front makes on the student is one of oddity and the apparent attempt to do the unexpected. It is not, perhaps, necessary to dwell upon the separate details of this very surprising composition, as it is not praise which should be apportioned to them.

More architectural in its character is the house No. 54 East 62d Street. This, which is one of the numerous houses of the present day in which the entrance is worked into the basement so that scarcely a step raises the floor of the ground story from the sidewalk, is certainly a good and well-proportioned front of this kind. One may sympathize heartily with the preference for an entrance on the basement floor, and yet feel in a certain way repelled by the absence of any dignity given to the entrance doorway. Unquestionably this feature has the authority of excellent practice in the past. Mediaeval houses, at least—that is to say, the houses of the later Gothic style and earlier Renaissance—are much given to this practice of putting the doorway in an unconsidered place. It is as common as any other peculiarity. The arranging of the windows with careful reference to one another and to the general proportions of the exterior, while the doorway through which one enters is smuggled into a corner where, indeed, it is in no way an offence to the composition, but where it has little prominence—let that theory once be assumed, and the building gains, perhaps, in the facility with which it can be properly distributed. The present front seems a really admirable design as far as the sill of the fifth story windows. So far a graceful and well considered proportion exists. Above it, the somewhat too heavy cornice and the somewhat too aggressive brackets at its extremities help to make up an attic story rather out of harmony with the rest of the front.

The somewhat smaller house in East 71st Street has also its en-



RESIDENCE OF T. WYMAN PORTER, ESQ.
No. 23 East 56th Street, New York City.
Clinton & Russell, Architects.

trance doorway in the basement, but here the old type of "English basement house" is followed, and the arrangements are not unfamiliar. The armorial achievement sculptured on the pier between the windows of the fourth story is exactly where it should be put to give some unity to the composition as affording a centre to what is otherwise divided into two equally balanced parts. With the same object in view these heraldic sculptures might have been heavier and have counted more strongly upon the design — with great advantage.

The house, 23 East 56th Street, is again an English basement house, with the very modern feature of a bay-windowlike projection occupying nearly the whole of two stories. The breaking out of this by a few inches only, strengthened and insisted on by the larger projection of the balcony above, acts more as an architectural feature to give a central motive than in any way to give the interior what is rightly called a bay-window. A resulting fault seems to be that the main cornice is very close to the balcony; and it is doubtful whether the front would not have been better with the cornice raised a story, so that

what is now the attic would become a part of the wall proper. The house is unusual in having an additional low story occupying a sort of garret in the roof, and this goes to make the architectural attic unusually heavy and to crowd the cornice all the more down upon the balcony which it overhangs.

The Knickerbocker Apartment House, at Fifth Avenue and 28th Street, is not to be insisted on. It was built long ago, and hardly compares to its advantage with more recent work by either of the architects or by the firm. This was one of the earliest buildings in New York entirely faced with light brick. No special virtue can be ascribed to the exterior, except a good use of the iron balconies, and the iron work itself of these balconies, if it is, as one is bound to believe, really wrought-iron—hand-work of the simple sort.

St. Bartholomew's Parish House stands in East 42d Street, on the north side between Third and Second Avenues. The older structure is by another firm, but Messrs. Clinton & Russell are now finishing a large extension to the building, and this has been well combined with the front, which was not disagreeable in itself. The stone basement is of a light, warm gray, and all the upper part of the iron is of yellow brick. A very delicate feeling for the proportion of the large round-arched openings of the ground story is visible, and can be seen in other parts of the front as well. That, for instance, was a good and truly artistic thought which carried the abacus of one of the pilasters through the big piers from side to side. A less careful designer would have tried to carry the whole capital of the pilaster along horizontally, and would have injured his composition in so doing. There is in the interior what promises to be a rather interesting chapel, with girders carried on columns and square piers. All this is of plaster, no doubt, though that plaster follows and covers the necessary construction, and some of the piers in the upper story which are seen to form the composition and to carry the ends of the great girders which are supported elsewhere by round columns, are piers in name alone, resting as they do on the girders of the gallery below. Such an interior has to be taken as it is. The composition is made without very great reference to the construction; or if the construction of a building has dictated, as in this case, the main features of the design, any one obstacle to the completeness and the consistency of the design is yielded to instead of being struggled with. This is the law which seems to underlie all our modern designing, and under that law only the superficially interesting can exist. Serious designing becomes, of course, an impossibility when men are free to force the building, and take from it or add to it for the sake of the composition conceived apart from the requirements of the structure.

The small dwelling houses in West 73d Street, Nos. 20 and 22,



FOUR RESIDENCES FOR W. W. ASTOR, ESQ.

Fifth Ave., northeast corner 56th St., New York City. Clinton & Russell, Architects.

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RESIDENCE.

N. E. Cor. Fifth Ave. and 56th St., New York City. Clinton & Russell, Architects.



RESIDENCES.

56th Street, N. E. Cor. Fifth Avenue. Clinton & Russell, Architects.

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cause one of the simplest, of the designs yet produced in New York for such combinations of small houses.

On a much larger scale and at vastly greater expense, the four houses at the northeast corner of Fifth Avenue and 56th Street equally combine to produce one design. Perhaps it would be more accurate to say that three houses—namely, the very large one on the corner and the two next adjoining it—form one group, while the fourth house is kindred in design, but is like a small separate dwelling closely adjoining a vast and stately mansion. That which seems the great mansion has two sharp gables on East 56th Street, each gable having, perhaps, thirty feet of frontage, while between these a curtain wall of perhaps fifty feet is pierced by three large vertical systems of windows held together by pilastered frames, and above these three great dormer windows of elaborate design. The basement story is pierced with small round-arched window openings and with entrance doorways closed by three-centred arches, and this basement story is somewhat out of keeping with the superstructure. In that superstructure the use of the pilasters and the frontons of the upper windows in the gables, and the dormers and chimneys rising out of the steep roof with an open parapet which combines with them, are all very carefully studied, and studied with a good deal of success, from the earlier work of the French Renaissance. The actual sculpture, as of the capitals, the candelabrum ornaments of the doorways, etc., is not fine. It is hasty and rough and looks as if it had been cast instead of carved, but it is effective enough from a distance, lacking only in depth of shadow and apparent solidity. It is unusual to see so frankly picturesque a treatment of so large an exterior. New York in late years has rarely known a composition with so much of non-classical movement and sparkle. It is generally for churches that that kind of design is reserved, and the churches have never taken to Renaissance details.

It is a fruitful theme for sermonizing on the vanity of our architecture to examine the rear of such a building as this, and see how completely the steep-roofed and gabled character is abandoned in the unarchitectural walls which look upon the gardens and courts within. The great pavilion on the corner of Fifth Avenue has its northernmost gable an echo of the gable fronting on 56th Street, but this gable wall, which has no windows in it, will, of course, be concealed by the adjoining house when that will be built by and by on Fifth Avenue. Elsewhere this northern exposure shows plain, flat-roofed, five-story houses, denying utterly all pretensions to the kind of structure which involves steep roofs and dormer windows. Perfectly explainable! Unquestionably the five-story flat-roofed houses are less expensive to build and are more convenient to the residents. Whether we shall ever develop an architecture from the actual re-

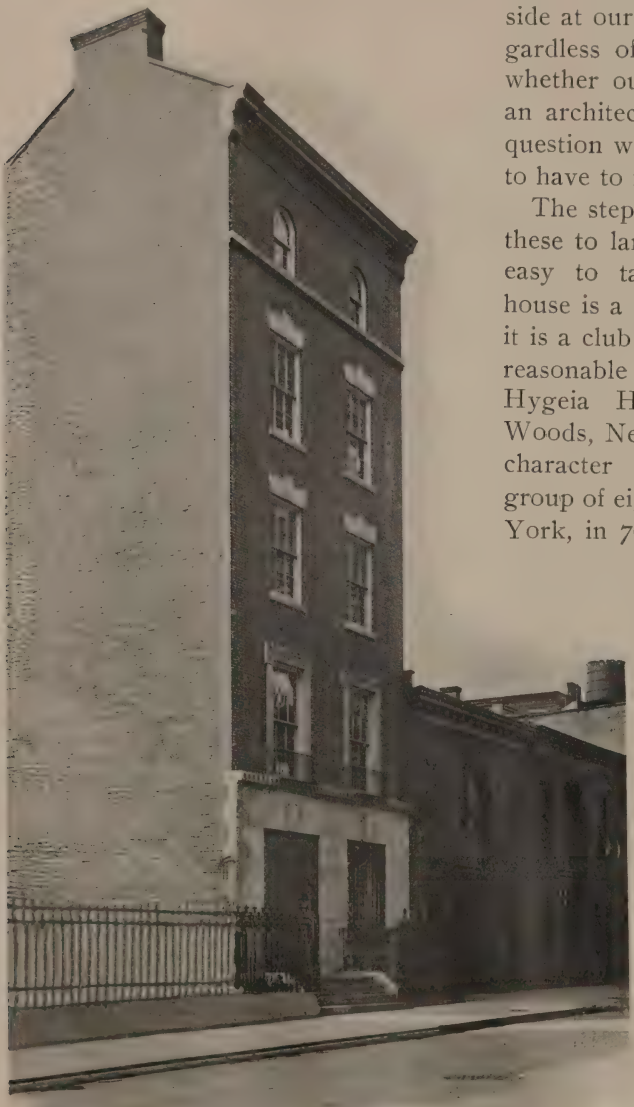


RESIDENCE OF L. K. WILMERDING, ESQ.

18 East 77th Street, New York City. Clinton & Russell, Architects.

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quirements and conveniences of our structures, and leave off borrowing the artistic side from another and an ancient community, while we develop our materialistic side at our own pleasure and regardless of artistic results; or whether out of this incongruity an architecture ever arises, is a question which it is disagreeable to have to face.



RESIDENCE OF R. M. BULL, ESQ.
No. 40 East 40th Street, New York City.
Clinton & Russell, Architects.

The step from such designs as these to large country houses is easy to take, and a country house is a country house even if it is a club or a hotel of not unreasonable dimensions. The Hygeia Hotel, at Point o' Woods, New York, differs in its character of design from the group of eighteen houses in New York, in 70th Street, mainly in the epoch where it has found its prototype. The eighteen small houses form together the simulacrum of an Elizabethan mansion. The hotel is rather a country house of the time of William III., except that no English country house ever had such a bounteous supply of broad verandas. The simplicity and absence of fuss about this composition recommend it strongly. It is one of the best in design of the numerous country hotels built during the last twenty

years, and, with the design there comes to the student a feeling that in this hotel at least, he would not be too unreasonably crowded. It has a pleasant air of being large enough for its inhabitants.



CASINO.

New London, Conn. Clinton & Russell, Architects.

The Casino at New London is also peculiar in its simplicity. In previous articles dealing with the work of other architects occasion has been found to praise the far more fantastic and varied designs sometimes used for these meeting places at fashionable points of summer resort. The severe reserve of the present design is also, in its way, agreeable. The management of the basement of rough stone, which basement is made a permanent feature by forming everywhere the substructure of the verandas and their parapets, is certainly unusually successful, and the frank use of very small and slender columns to carry the seemingly heavy roof of these verandas is a fitting recognition of the true structure of such pieces of carpentry work.

The dwelling house at Oyster Bay is somewhat in the same simplified classical style as the hotel and Casino last above named. It may be that for a large dwelling house the reader would like more ornamentation—a freer and less grudging use of those devices which make architecture out of simple house building. It may be that the Venetian windows, planned on a very small scale and crowded into the gables, are inappropriate, as reducing to a minor feature that which was intended to be sumptuous.

The vacation cottage built on Coney Island for the Association for

Improving the condition of the Poor, and which consists now of two considerable buildings connected by a lower passageway and by a very useful and well-imagined veranda, is really a contribution to our already considerable stock of agreeable seaside and country-side domestic buildings. It is fitting that such a building as this should be almost wholly without decoration in order that there may be as much wholesome accommodation as the money will run to. The buildings under consideration are entirely satisfactory and appropriate to their purpose.

Almost as simple in design is the Leavitt residence at Short Hills, N. J., in the Old Colonial style, with a boldly projecting carriage-porch carrying a broad balcony and an arcade of five round-arched windows opening upon this balcony. Fortunate it is for the lover of revived classical art,



RESIDENCE OF ALEXANDER TAYLOR, ESQ.
Mamaroneck, N. Y. Clinton & Russell, Architects.

when, as in the case of these imitations, the last-century work of classical details may be carried out in wood simply painted. Then, indeed, such a designer ought to be happy, for it is a received principle of the present classical revival in America that form is everything, and that reasons for that form are to be looked for only in the designer's notions of what is pleasing—never in the material or in the way in which the material is used. Looked at from this point of view, as a piece of theatrical composition as if for a scene painting, one thoroughly approves the richness of the lower windows, with

their broad headpiece consisting of a frieze of sculpture and a fantastic fronton above.

The house at Mamaroneck is a singularly agreeable instance of the picturesque treatment given to so many of our larger country houses. In this instance, the use of the retaining walls and terraced stairs, dividing the upper lawn from the lower ground and the sea, is very good and graceful, and the house itself rises, as in our view, most agreeably from that massive bounding wall. In this, as in other such cases, the question arises as to whether the seeming timber-frame construction is genuine or not. That of the lower story, which forms a vast enclosed veranda, is unquestionably of timber, but sad experience has taught the student not to expect such extravagances in the framing of the walls of the house proper. As has been said



RESIDENCE OF D. WILLIS JAMES, ESQ.
Clinton & Russell, Architects.

many times, it is no sin to imitate half-timber construction by applying boards upon plaster:—but how can a designer condescend to it!

Larger country houses are the interesting Tudor mansion, at Portchester, New York, and the larger Elizabethan, or Tudor, house at Madison, New Jersey. Of these, the former is interesting on account of the unusual disposition of its entrance and carriage-porch, which, indeed, is a little hard to understand from the slight illustration which we give. The plain, round-arched windows, of which a group of two pair is interposed between the entrance porch and the gable on the left, are out of keeping with the style as being of an earlier and far more unconscious age. On the other hand, the frontispiece of the



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CHURCH IN HARLEM.

Clinton & Russell, Architects.

carriage-porch, with its pilasters and pedestal blocks, is later than the rest of the house, but this one condones, or even approves, because the prototype—namely, the English country mansion—is often so varied, the porches being found of later date, or at least of later style than the body of the work. The large house at Madison is really an admirable composition, and is well supported by the interesting stables which show in the same general view, as if carefully thought out in connection with the landscape effect which would contain and include all the buildings on the place. The more this house



RESIDENCE OF D. WILLIS JAMES, ESQ.
Madison, New Jersey. Clinton & Russell, Architects.

is studied the more fortunate it seems to be. The large illustration gives the house from a good point of view, and the house, seen with its surroundings, is of great and unusual interest.

A house at Islip, L. I., is of character unusual among American suburban or country houses. It is a square villa of formal design in the style of the French Renaissance, the pillars and roof of the broad verandas being thoughtfully and successfully carried out in the same manner of composition.

This review of the work of Messrs. Clinton & Russell, completed or in hand, must end with the interesting little church in Harlem, of which an illustration is given. For church fronts on city streets, it is a most desirable and unfortunately not too common treatment,

this of the gable showing between two small and simple turrets. The great tower is really out of date, now that bells are not only admittedly useless, but also admittedly a nuisance; and when, moreover, no church tower can equal in mass and height the business buildings which rise near it. Here a front is so filled with windows that the small auditorium is almost sufficiently lighted from this front alone, while below the great windows an entirely sufficient porch is entered



SITTING ROOM IN RESIDENCE OF D. WILLIS JAMES, ESQ.
Madison, N. J. Clinton & Russell, Architects.

by a good doorway and lighted by small but adequate windows. Small churches, and even larger ones, may better be arranged in this manner, and may more wisely take this as their type than to affect the bolder treatment of buildings standing free in ample surrounding grounds.

In general it is not worth while to give much consideration to unsuccessful competitive designs. Competitions are poor things, and architects of standing are apt to treat them as such. Mr. Clinton's design for the Grant monument is, however, so singularly graceful that an illustration of it is given here that the public may see what it has lost. When the designs offered in competition were exhibited



GALLERY IN RESIDENCE OF D. WILLIS JAMES, ESQ.
Madison, N. J. Clinton & Russell, Architects.

in the Ortgies Gallery the design before us seemed to be the best among them, and there seems now, after the lapse of years and the carrying to completion of another design, no reason to change that opinion. If the building could have been built, with statues set upon the pedestals of the circular attic above the great order and those of the balustrade of the second drum, these being substituted for the vases and the balls shown there, this would make a design of extraordinary splendor. It is to be hoped that it may be carried out for some other memorial purpose.

Russell Sturgis.



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DESIGN SUBMITTED FOR THE GRANT MONUMENT.

Clinton & Russell, Architects.



ENTRANCE TO RESIDENCE OF CHARLES W. CLINTON, ESQ.

23 East 79th Street, New York City. Clinton & Russell, Architects.

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The
Architectural Record.

VOL. VII. OCTOBER-DECEMBER, 1897. No. 2.

FRENCH CATHEDRALS.

PART XII.

*THE MARITIME CATHEDRALS.**

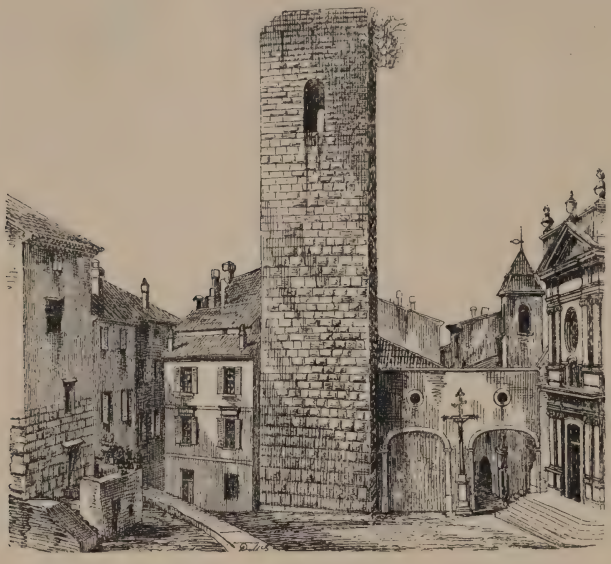
I.

ON the shore of the Mediterranean coast of France, directly on the sea, is a series of cathedrals extending from the Italian almost to the Spanish frontier, having certain characteristics in common, owing to their exposed situation, and which may be conveniently classed as the maritime cathedrals of France. Not all of these churches are of the same interest. The cathedral of Adge presents the most imposing exterior because it has been carefully restored to its primitive condition. The cathedral of Maguelone is more characteristic, being outwardly scarce more than a pile of ruins, but restored within in excellent shape by M. Révoil at the expense of its owner, M. Fabrége. In Provence the cathedral of Antibes is the most notable example, the cathedrals of Vence and Grasse being comparatively unimportant; the cathedral of Fréjus has scarcely any visible exterior; the cathedral of Toulon has been greatly modernized; the old cathedral of La Major of Marseilles is hardly more than a ruin. To these might also be added the cathedrals of Montpellier, Béziers, Narbonne, Perpignan and Elne, to complete the series, though being later structures than the first-named they need not be considered in the present connection.

The cathedrals of Antibes, Grasse, Maguelone and Adge reflect very accurately the unsettled condition of the southern part of France at the time in which they were built. As late as the twelfth century the coast was exposed to the ravages of pirates and mariners.

*The line drawings which accompany this article are taken, by kind permission of David Macgibbon, Esq., from his valuable book, "The Architecture of Provence and the Riviera," the most accessible work to English readers on the architecture of the extreme south of France.

who gained a livelihood by preying on the peaceful and unoffending inhabitants of the villages and cities. The cathedrals, as the most important buildings and the most conspicuous, were strongly fortified, both to protect their contents and to serve as strongholds for th. citizens in case of need. In these churches, therefore, architecture assumed its most utilitarian form, and the buildings are real



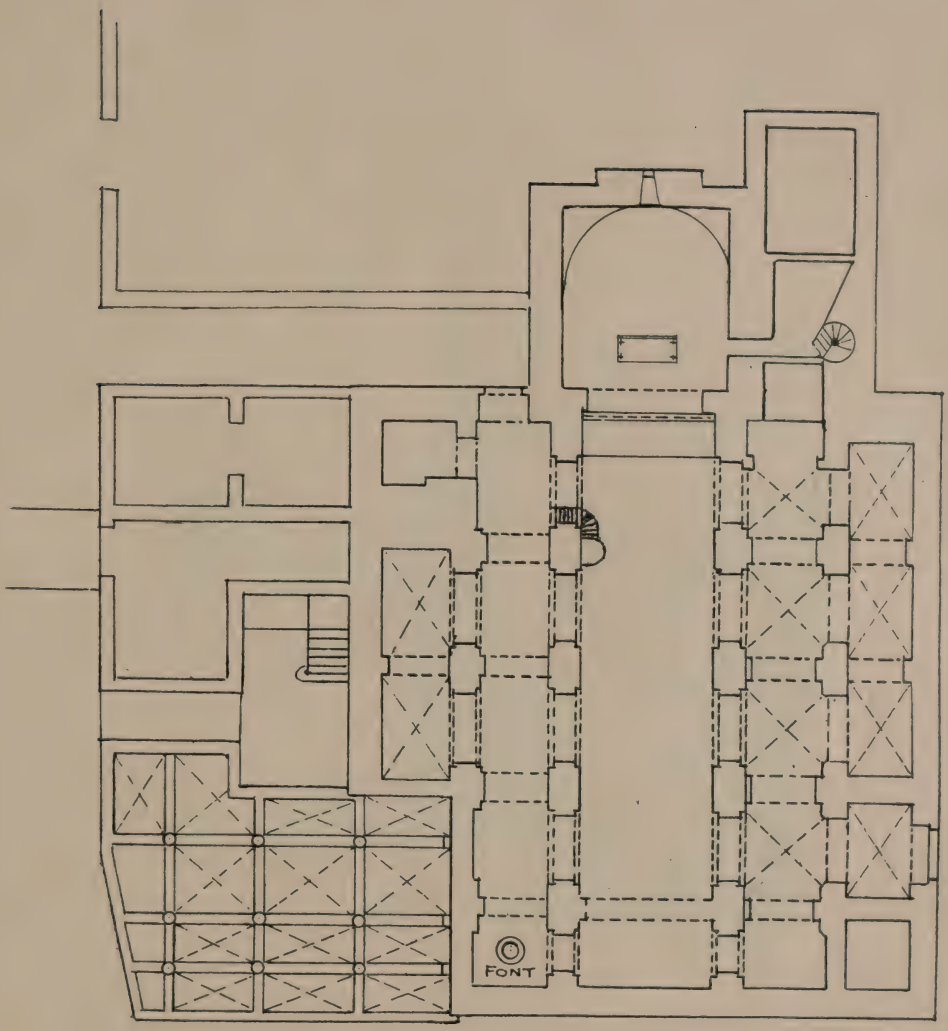
TOWER OR KEEP ATTACHED TO CATHEDRAL.—ANTIBES.

fortifications, with battlemented walls, strong and heavy towers, and small windows, and are provided with the other devices of Romanesque architecture of a purely military type.

Time has dealt hardly with them. The kingly power, being entrenched in Paris, France, developed from the Ile de France; the wealth that once enriched the fertile lands of the south moved northwards, and the great commercial cities of the north became the most important sources of activity. Then the southern towns began to decline; and while in the north the little Romanesque churches were removed to make way for the splendid creations of the Gothic period, in the south they were patched together as best they could, or permitted to fall into decay, and, last of all, repaired and restored in that most unfortunate of all epochs, the seventeenth and eighteenth centuries.

II.

Take, for example, the cathedral of Vence, one of the oldest in France, but now so overlaid with additions and suffering from so many misdirected restorations that scarce a suggestion of its antiquity remains. Yet it is of value in illustrating the successive



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VENCE CATHEDRAL.—PLAN.

steps by which the hall cathedral of the tenth and eleventh centuries was developed into the cruciform cathedral of the thirteenth. In the tenth century its plan was a Latin cross, rather long and narrow, with well-proportioned transepts and a slightly longer eastern arm. The campanile stood close to the north transept, free and distinct from the church. The town is situated in the mountains, and, having been provided with strongly fortified walls, it happened that the barbarian hordes that overran France at various times never con-



VENCE CATHEDRAL.—SECTION.

quered the city. The people crowded into it for safety, and in its limited area every spot was closely pressed upon; the tower of the cathedral was occupied by families, and its summit used as a look-out for signs of danger. Soon additions were needed; the transepts were extended along the nave and became aisles; the choir was added to on each side, and the cathedral became a rectangle with a square apse.

Towards the close of the twelfth century further additions and changes were made. A chapel was formed under the tower and outer bays were added to the aisles, at least towards the east end, making the plan a distorted Latin cross. In the fifteenth century new and extended changes were introduced. Galleries or tribunes were built over the aisles; a canon's choir was built at the west end over the nave, which thus lost here half its height; internally the apse was given an oval form and decorated with a Corinthian order. But the end was not yet reached. The beginning of the present century saw further alterations; the nave vault was rebuilt in elliptical form, and the artistic ruin of the cathedral was complete. It is closely surrounded with houses and has little external interest save in its apse

and its tower. Within it is crowded with aisles and arches, and dark almost to dullness by reason of the minuteness of its windows; a cathedral whose evolution has been its ruin and whose greatest misfortune has been its restorers and its rebuilders.

Of its external features only the tower and the apse call for comment. The tower is plain and severe, with a round-headed window



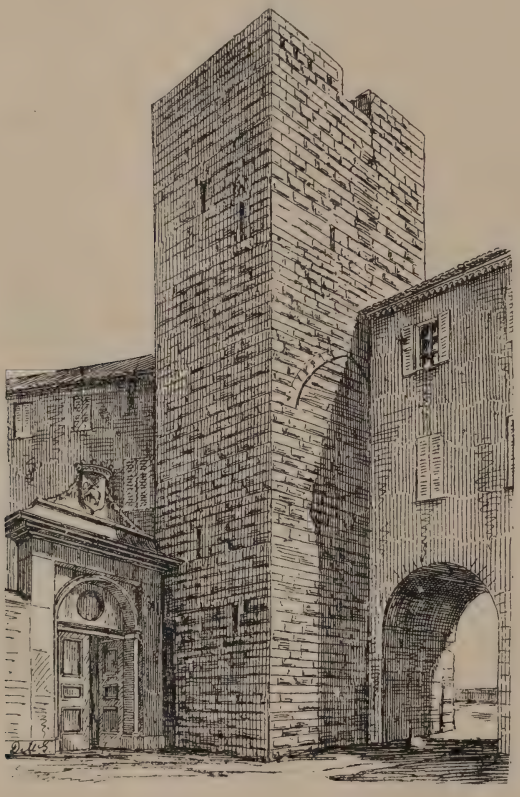
VENCE CATHEDRAL.—EAST END.

near the top for the bells, and crowned with battlements of a simple type; it is a good illustration of the church towers in the extreme south of the eleventh and twelfth centuries, and is typical of the maritime churches. The apse still retains its form of the end of the twelfth century; it is rectangular, with a broad shallow protection in the centre with a small splayed round-headed window and a low gable. Internally, a description would be a bare enumeration of piers and arches singularly devoid of interest. Its qualities are negative, not positive. There is no carving, no decoration, no ornament. The pilasters are plain, the capitals and corbels supporting the arches without artistic interest. There is not even the balancing effect of a

built interior, for every bit of surface has been painted a sickly yellowish tint that entirely covers the structure. The only artistic contents are the fine carved high-backed stalls in the choir at the west end, and a carved Gothic door that stands in the chapel under the tower. Both are good examples of their sort, but they do not relieve the cathedral from its inherent architectural poverty.

III.

The cathedral of Grasse is more akin to the early Italian Gothic than to the Romanesque of Provence. In a measure it stands be-



KEEP TOWER.—GRASSE.

tween the two, its heavy forms, its lack of carved ornament, its massiveness, belonging distinctly to the Provençal school, as represented by the cathedrals of Orange and Fréjus, while the outline of its façade, its two principal doorways and its towers suggest Italian influence, more clearly seen in the cathedrals of Sisteron and Embrun. Like all Provençal cathedrals it was greatly changed in the seventeenth and eighteenth centuries. Its most notable transformation was the building of the crypt in the last century from the designs of Vauban (done in 1719), consisting of a nave with very narrow aisles,

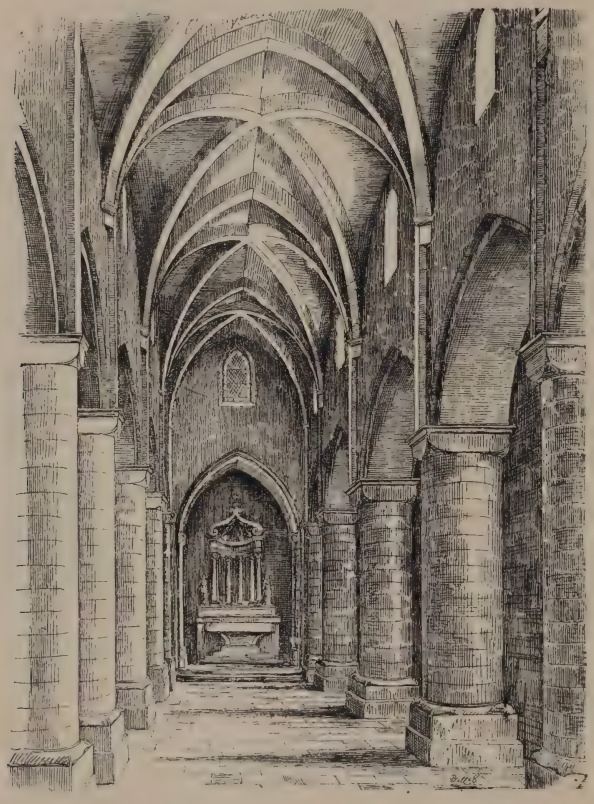


GRASSE CATHEDRAL.—WEST END.

separated by gigantic piers. This tremendous undertaking of building a crypt under a church after it was erected was carried out to provide a place of burial, and the Chapter speedily obtained revenue from that cause. It has no artistic character.

And indeed the same may be said of the upper church. Its nave of six bays, with an aisle on each side of it, leads to a deep rectangular chamber that, in 1680, was built on the site of the original choir or apse. The pointed cross vaults of the nave are carried on large heavy ribs of square section, resting on huge round piers. Mgr. de Mesgrigny, who built the huge crypt, added tribunes over the aisles, giving them flat segmental arches, adding to the area of his cathedral, it is true, but sadly injuring the simplicity of its earlier form. Of the chapels opening from the aisles only one calls for mention. It opens from the fourth bay of the south aisle, and was built in 1738, by Mgr. d'Antelmy, who also carried out some repairs to the choir and to other parts of the cathedral. It is dedicated to the Holy Sacrament, and is richly decorated in the style of its period, with un-

chanelled Corinthian pilasters, an ornamented entablature, and a vaulted ceiling. Plaster statues of the Evangelists by Baillet stand in niches in the walls. The situation of the cathedral, on the apex of a hill that descends abruptly to the east, is such that this chapel is supported on a crypt, which is at a lower level than the main crypt, though it opens immediately from upon a public place surrounded by houses.



GRASSE CATHEDRAL.—INTERIOR.

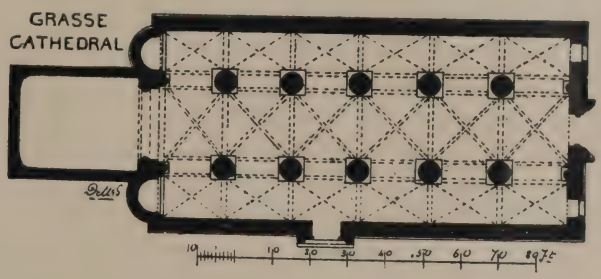
From this point the cathedral rises above the spectator to a really great height, but the architectural forms are without interest.

Fortunately, the general barrenness of the structure is relieved to some extent by the west front, which at first glance seems of so foreign an aspect as to be scarcely French and certainly not Provençal. The nave clerestory has a low, flat-pointed gable, and the aisles are marked by an inclined cornice. There are no vertical divisions between the parts, but at each outer edge the wall is thickened as a buttress or pilaster without capitals. From the inner edges an arcade of small pointed arches is carried on plain triangular corbels, following the sloping lines of the aisle roofs to the beginning of the nave

clerestory, where it is carried horizontally across the front. The clerestory is treated in a similar manner, with a large pointed window in the centre.

There is now but a single portal, a pointed recessed archway in a very shallow projection roofed with a nearly flat gable. When the crypt was built a new flight of steps was arranged, with an opening in the centre leading downwards; at the same time the side portals were walled up, though their outlines are still visible. Not far from the cathedral, on the left of its west front, and connected with it by a modern unimportant building, is a large mediaeval tower or Keep, very plain and severe, and without ornament—a strong and mighty structure, similar in form and in utility to the tower of the cathedral of Antibes, which occupies a similar postion. It is the characteristic feature of the coast cathedrals of France.

There is another tower at the east end of the north aisle, whose base is now embedded in the walls of the choir of the eighteenth cen-



GRASSE CATHEDRAL.—PLAN.

tury. Its position is identical with the tower of the cathedral of Sisteron. Restored in 1486, it was destroyed in a storm in 1742, and its rebuilding was begun in 1756. It is entirely plain, its upper part being divided into three portions by strings, the two upper of which have a frameless round-arched window in each face. Apart from the west façade and the towers, the exterior offers little of interest. But the superb view of Grasse and its vicinity that may be obtained from the open place on the north of the church compensates the visitor, to some extent, for the trouble he has taken to climb to this height. The cathedral, however, is only interesting as illustrating the fusion of certain Provençal and Italian elements.

IV.

The cathedral of Antibes is, perhaps, the best type of the maritime cathedral in Provence, though it is surpassed by the churches of Les Saintes Maries and S. Victor at Marseilles, both of which are true fortified churches. Like all the coast cathedrals it is small, with a

nave of five bays, aisles, very short transepts, and three rectangular apses on the east. And, as in the other cathedrals, there is the same barbaric "restoration" of the seventeenth and eighteenth centuries, the same confused interior, with piers, arches and vaults of almost every possible section and form, a veritable conflict of architectural members, not even interesting in its variety. The apse of the nave is a deep chamber, divided into three bays by unchannelled Corinthian pilasters, with two narrow, round-arched, splayed windows, with a circular window in the middle above them, in the eastern wall. The transept apses are smaller, with pointed tunnel vaults and a small round window to the east.

The apses directly face the sea, being separated from it only by a narrow roadway, which is supported by a sea wall. Externally, they are entirely featureless, but the heaviness of the construction, the narrow windows, and above all the tower which rises on the south, a plain, tall, severe shaft, with a single window in each face near its top, are strictly in keeping with the exposed situation. A similar tower, as in the cathedral of Grasse, stands before the west front of the cathedral, separated from it by a double archway of the seventeenth century. It has lost its crowning member, and is solid, save for the round-arched window near its top. The façade of the church is of the seventeenth century, and is in two stories, with Ionic pilasters. All of the external walls are plastered except the east transept walls and the apses, which show marks of some slight restorations.

V.

The cathedral of S. Etienne at Fréjus, though unimportant individually, is a more pretentious structure than the other maritime cathedrals, because it has retained its cloister, and, like the cathedral of Aix, it also has a baptistery, which, though now part of the cathedral group, was once distinct from it. As is to be expected, it has suffered severely from changes made at various times, the latest, and not the least important, dating from 1823, when the façade was demolished and the present severe and simple aspect given to it. The group of buildings, now practically encased in a symmetrical and uninteresting exterior, and in a large part closely surrounded by dwellings, consists of the cathedral itself, the cloister at the baptistery and connecting passages and structures. The church has a wide nave of three bays and a large semi-circular apse. It has but one aisle, on the north, a narrow alley, with two small chapels opening near its centre. At the west end of the nave is a large, heavy tower, whose lower chamber forms an enclosed vestibule connected with a narrow passage which forms the chief entrance to the cathedral. The baptistery is also reached by this passage, and its continuance beyond the



FRÉJUS CATHEDRAL.— DOOR.

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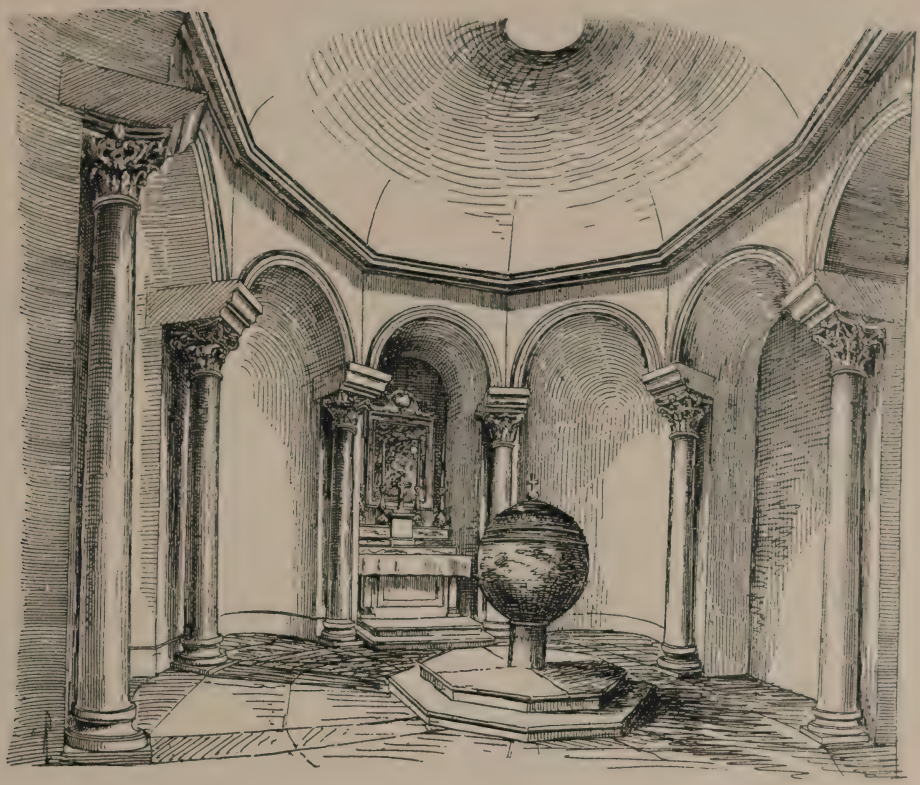


FRÉJUS CATHEDRAL.—INTERIOR.

tower in a narrow flight of steps leads to the cloister, which is on a higher level than the other buildings of the group, and whose dilapidated condition makes it one of the most melancholy monuments in Provence.

A glance at the plan shows a structure of no ordinary interest. The interior of the tower is complicated with vaults, recesses, deep arches and other devices, producing an astonishingly crowded effect in the small space, and yet it is nothing more nor less than a narthex, and the resemblance is heightened by the baptistery just without the ancient lines of the church walls. The building of the cloister on the north of the church, at a time considerably later than that at which these earlier structures were erected, and which, in its origin, is the latest form of the narthex, adds to the interest of the plan, since we have this feature, in a considerably modified form, it is true, present in an early and a late stage in the same building, a circumstance if not unique, at least so rare as to be worthy of special note.

The interior of the nave, with its low cross vault and its heavy piers, the absence of carved ornament, and the irregular manner in which its windows have been inserted, together with the tawdry



FRÉJUS CATHEDRAL.—BAPTISTERY.

wooden wainscoting carried around the lower part of the walls and piers, is somewhat gloomy, notwithstanding the whitewash with which all of it has been covered. Once, indeed, we are told, the interior was much more lofty than it is now, the floor having originally been at a much lower level, but there is no record of the time at which it was raised, nor has modern research been directed to ascertain the truth of this statement.

The nave piers are of great size, large and heavy and capped with a simple band moulding, and may, if we choose, be considered internal buttresses. Each of the three bays has a round cross-vault with square, thick ribs, similar to those in the cathedral of Grasse, and in the nave of the cathedral of Toulouse. A striking peculiarity of the nave arches is that two of them have an inward return at the base giving them a true horse-shoe form. Broad longitudinal arches spring from pier to pier next the walls, but the vault section does not follow them, being of a domical form. All of the ribs and arches are without moulding or ornament of any sort. On the north side the arch of the third bay to the aisle, forming part of the choir, is partly built up and closed, while the aisle, owing to a deep transverse arch

at the beginning of the nave which is omitted in it, is not quite so long as the nave. It is covered with a tunnel vault, with slender transverse arches, and extends beyond the nave parallel with the choir is a bay whose sides are slightly inclined towards the east, where it is closed with a straight wall. The nave apse is of the usual Provençal type, a narrow rectangle, roofed with a tunnel vault forming the arched entrance to the semidome, which is slightly lower and

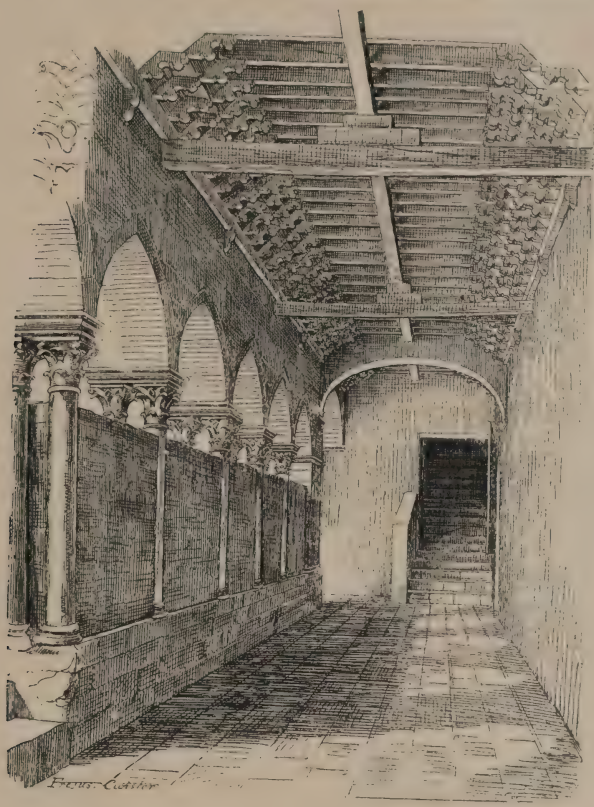


FRÉJUS CATHEDRAL.—CLOISTERS.

of smaller diameter. The altar is in the third bay of the nave, which forms part of the choir, the entire apse wall being surrounded with stalls of carved wood, with flat geometrical designs, which, while good in their way, are not notable examples of wood carving.

The determination of the period at which such an interior as this was erected is a task of no small difficulty. There are no written documents or records, and its present state is not warranted to afford much help. That the city of Fréjus was destroyed by the Saracens in the early part of the tenth century is an established fact, and that towards the end of that century the celebrated bishop Riculfe (about 975) rebuilt it, appears likewise indisputable; but that any considerable portion of the cathedral fabric dates from that time can scarcely be seriously considered. The latest writer on the cathedral of Fréjus, the Abbé Espitalier (Les Evèques de Fréjus du VIe au XIIIe siècle, Draguigan, 1894), does not hesitate to assign the

tower and the north aisle to the tenth century, and places the beginning of the nave at the same epoch, basing his argument on an alleged similarity in structure between the two parts, and upon the fact that the vault of the aisle is earlier in form than that of the nave. That the latter part of this argument is true cannot be doubted, but certainly the reasoning is at fault. The aisle is a narrow passage, much too small for a church itself, a circumstance that satisfactorily deter-

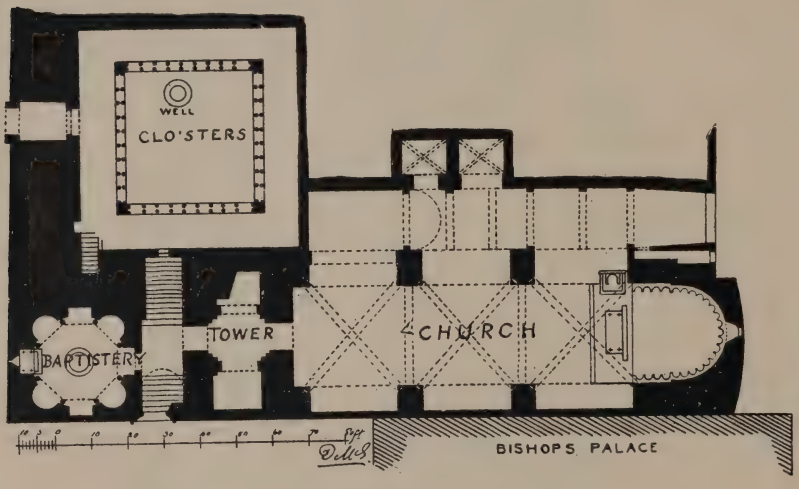


FRÉJUS CATHEDRAL.—CLOISTERS.

mines its non-priority in date. And, moreover, it does not run directly from the tower, as it would have done had the two portions been erected at the same time. No builder would have first finished a secondary part of his structure before undertaking the main portion. There seems, indeed, no reason to attribute the body of the cathedral to an earlier time than the twelfth century. The fact that the lateral edges of the nave vaults do not exactly follow the lines of the transverse arches suggests that they may be later than the lower part of the walls; but the difference in time cannot be great, else a true pointed vault would have been built. It is important to note that the small area of the tower, both in the lower and upper parts

has round tunnel vaults, which certainly antedate the vaults of the nave. The forms of the piers and the width of the nave point only to such a roofing as is actually in place. As for the tunnel vault of the aisle, that was probably determined by questions of economy as well as by the great width of the nave bays. The arches between the nave and the aisle are simply cut in the separating wall and are without chronological value.

A similarity so great as almost to be called extraordinary exists between the cathedrals of Orange and of Fréjus. The plan of the latter, as has been seen, is more complicated than that of the church at Orange, but the essential points of resemblance are very striking. Neglecting its aisle, the plan of the cathedral at Fréjus is almost exactly that of the cathedral of Orange. Both have a broad nave,



FRÉJUS CATHEERAL.—PLAN.

with large internal buttresses connected by broad arches or tunnel vaults. It is true that in Orange the vault of the nave is pointed, while at Fréjus it is a cross vault, but the structure is almost identical in both cases. In the latter church, also, there is no domed bay before the apse, but the tower which at Orange surmounts the dome is at Fréjus above the apse. More remarkable is the similarity in the detail and structure. Both are cathedrals in ancient Roman cities, whose remains are still their greatest attraction to the tourist and the archaeologist. Yet in neither is there hint of this rich suggestive architecture which elsewhere in Provence was incorporated as an integral part of the decoration. In Orange there is nothing at all of it; in Fréjus the only ancient remains in the cathedral—excepting, of course, in the baptistery—are some columns brought from the amphitheatre to support the organ gallery at the west end of the nave. But though there is no Roman detail in these churches their type is

purely basilical and reproduces, almost in identity, the plan of the basilica of Constantine in Rome. The Roman influences would seem, therefore, to have been manifested in these cities in a different manner than elsewhere in Provence. It is needless to add that churches so similar must be of identical date; both belong, therefore, to the time that immediately succeeded the employment of Roman detail in Provençal architecture, and were probably erected in the first half of the twelfth century. It is, perhaps, a useless guess to suggest that they were designed by the same master builder, but certainly the guiding spirit of the one was entirely familiar with the other.

The baptistery is a structure of great interest. It is octagonal in plan, with shallow rectangular recesses in the main axes, and semi-circular domed niches in the diagonal axes. In each angle is a plain monolithic gray granite columns, whose capitals of white marble are Corinthian, save one, which is Composite. A stone over them is moulded on the outer edge only, and is a survival of the entablature. The plain, round arches are slightly moulded on their outer edges. The dome is modern, with a small circular lantern. Immediately below it is a globular baptismal font, which rests on a fragment of an antique column. All of the interior, save the shaft of the columns, has been whitewashed. In the seventeenth century this baptistery contained seven altars, as does the baptistery of Aix to this day. Authorities are divided as to the date of this edifice, but it is unquestionably the oldest part of the cathedral group.

There is a close similarity between this baptistery and that of the cathedral of Aix, but an even closer analogy exists between it and the so-called "Pantheon" at Riez. In this building the outline of the ground plan is precisely the same as at Fréjus, but the dome is carried on a series of free standing columns, as at Aix, while at Fréjus they stand against the angles formed by the niches.

The cloister, which dates from the thirteenth century, is on the north side of the cathedral. In its early days it was doubtless a charming and delightful structure. The arcade has eight plain pointed, unmoulded arches on each side, carried on slendor double columns, with delicately carved capitals. Now all is changed. The cloister is not only deserted and in decay, but the columns are enclosed in rough walls, which leave only their capitals free with the space above them. Two of the galleries, and none of them appear to have been vaulted, have an interesting flat wooden roof, corbelled out on each side, and forming a series of small squares, which is painted with scenes of various sorts, with figures or with animals—a curious and interesting work, though difficult to see.

This complicated group of buildings is encased in enclosing walls of little interest. On the south, part of the base of the tower and the

whole of the baptistery is faced with a continuous featureless wall. The pointed and slightly recessed doorway which leads to the passage between the tower and the baptistery is a mixture of Renaissance and debased Gothic and was completed in 1530. Much of the remaining walls of the cathedral are enclosed within dwelling houses, and such parts as are visible are without architectural features.

The striking portions of the exterior of the cathedral of Fréjus are its two towers, one of which stands at the west end of the nave, the other being directly over the apse. The western tower has a high, plain, solid, rectangular base, in which the round-arched windows have been blocked up. It is surmounted by an octagonal stage, with plain, high, single, light-pointed windows on the main faces, which, with the spire, covered with colored tiles, was added in the sixteenth century. Though this is the most conspicuous feature of the exterior, it is not so interesting as the tower at the east end. Its base, as has been said, forms the apse, but this is only visible in a slight swelling of the eastern wall, which is entirely plain, save for the apse window. The upper part contains a large chamber, originally used for storing arms and ammunition, and once wholly open to the west—the city side of the cathedral—by a large pointed, open arch, now bricked up. It is crowned with machicolations of small pointed arches or corbelled stones, with a balustrade that has been added recently. The swelling in the outer surface disappears immediately above the apse line, but reappears again in the battlements. It is interesting to note that this tower faces the direction of the sea, and its fortified state is suggestive of its once exposed position. Doubtless, the western tower, the rectangular portion of which is vaulted with a round tunnel vault, was finished in the same manner before the upper stage was added. Visitors to this cathedral should not omit the splendidly carved wood doors at the entrance, which are kept enclosed in rough wooden cases, and are rich and noble examples of a fine style of church decoration.

Barr Ferree.

NEVILL HOLT.

I.

ON one of the highest hills in Leicestershire stands a curious old house, which for centuries has been known as Nevill Holt. Holt signifies not only woods, groves and plantations, but also high hills.

"Ye that frequent the hills
And highest holtes of all,"

says "Old Songs and Sonnets," and agreeably to this construction of the word, the house occupies a lofty eminence, from which there is an extensive view of a rich and cultivated country. Directly opposite, across the valley, and on an equal height, stands Rockingham Castle, which, generations ago, served King John as a hunting box; history records that he hunted the red deer from there forty-seven times. Holt is mentioned in "Doomsday Book," and as far back as Henry I.'s reign in 1260, there are records of Reginald Fitzurse having held five *carucates* (or, presumably, hundred-acre lots) of land in Holt. Traces of the old Roman road leading from Chester to Colchester are still visible in the park, while in the village, at the foot of the hill, remains of a Roman bath have been excavated. So beautiful and perfect was the tessellated marble of the bath, that immediately on its discovery it was sent to the South Kensington Museum, where it is now to be seen.

In the year 1448 King Henry VI. granted leave to Thomas Palmer and his heirs to enclose and impark 300 acres of land and wood in Holt. At Palmer's death his only daughter and heiress married William Nevill, who then came in possession of all the property; and in his family it remained until thirty years ago.

The house itself is very composite, consisting of a long, narrow row of gray stone buildings, one end terminating in a protruding wing and the other in a beautiful old church, which joins the house itself. At right angles to the church is a square structure with an exquisitely carved stone façade. This was formerly a hospice; the carved shell over the door indicating it to have been a rest and shelter for weary travellers. It has since been converted into stabling for hunters, for Holt is situated in the heart of the best hunting country in England. The house was evidently the centre of a small village, and originally must have been a cluster or row of separate



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NEVILL HOLT.
(From a road in the Park.)

buildings, which, during the past six centuries, have been joined together and rebuilt by each successive owner, to suit his individual taste and convenience. The front door is built under a porch, whose top, delicately carved in light gray stone, is yet in an excellent state of preservation, the general design being quite distinguishable. To the right of the porch is a beautiful six-cornered window—what to-day we should term a bow-window. On the pillars, separating the



FRONT DOOR AND OLD STONE WINDOW.

diamond-shaped panes, rest male figures alternating with the shapes of fabulous animals; all are battered and worn by the winds and rains of centuries, but remarkable for the vigor and harmony of their conception. We admire the mastery which created these simple yet beautiful lines. So extraordinary is this early execution that, by comparison, the latter seems timid and meaningless. These carvings serve as a constant reproach to modern sculptors. That it is not possible to reproduce them to-day is proven by the modern window on the left of the doorway. The interior of the ancient bow-window finishes in a lofty arch, the stone ceiling carved in quatre-foil pattern and almost black with age.

At the back of the house are dreamy old cloisters, their rounded arches breathing an atmosphere of mystery and religion. Under these arches was the stone perambulatory, and above is still the private chapel of the Nevills, once a great and influential Roman Catholic family. The chapel itself is panelled from floor to ceiling in solid oak, carved with a delicate tracery. On one side three latticed windows look out on the greensward below; at the farther end once stood the high altar. The ceiling is supported by huge oak beams, and the whole is permeated with an air of almost hieratic dignity.



VIEW OF CLOISTERS AND CHAPEL.

Old women in the village maintain that a curse has been laid upon the house ever since this consecrated chapel ceased to be a place of worship.

Quite separate and distinct from the Catholic Chapel, at the back of the house, is the church, dedicated to Saint Mary, which may be seen from the front and which, although attached to the main building, forms no part of the dwelling, as does the chapel. It is a curious little edifice, consisting of a tower with a pretty, slender spire; a south porch; a nave; and a north and south cross, the latter separated from the church by an iron palisade forming a distinct chapel. In this



TOMB OF SIR THOMAS NEVILL.

small chapel are several beautiful monuments of the Nevill family, the most striking being one of Sir Thomas Nevill, extended at full length on his tomb, and dressed in armor. It is done in gilt and colored marble, and, although dated 1560, is in an excellent state of preservation.

At the first glance Holt Church seems to be a fair specimen of the perpendicular order, but the moment the details are examined it proves to be only the shell of a church of the fourteenth century, showing that the whole ground plan must have existed before the insertion of the perpendicular windows. The string course, running all around the building and dipping near the windows, is a proof of this. Here is an instance in which an architect of the fifteenth cen-

tury, while altering the church has not spoiled it. Behind the octagonal oak pulpit, a charming specimen of Jacobean carving, are two hagioscopes or squints from the south transept and the nave.

The churchyard in front was formerly enclosed in a high brick wall, and it is told of one of the Miss Nevills, who was evidently an autocratic person, that once in walking past she got her feet very wet, and, enraged at there being no pavement, ordered the tombstone stones to be torn from their places and laid prostrate on the ground, thus affording a protection for her feet against mud. When the pastor arrived the following day, he was horribly shocked at this act of vandalism, and ordered the tombstones taken up at once and put



VIEW OF CLOISTERS AND CHAPEL.

back in their original places. But as no one knew to which graves they belonged, it was impossible to place them properly. In despair the pastor had them set up at the back and sides of the church, where they have ever since remained, leaning against the sacred edifice. At the present time there are no headstones in front of the churchyard, and the high wall has been removed, being replaced by a low stone plinth.

On passing through the front door of the house one enters a small stone vestibule curiously carved with grinning female heads. Three graceful stone arches lead into a spacious and lofty hall, gaunt and im-

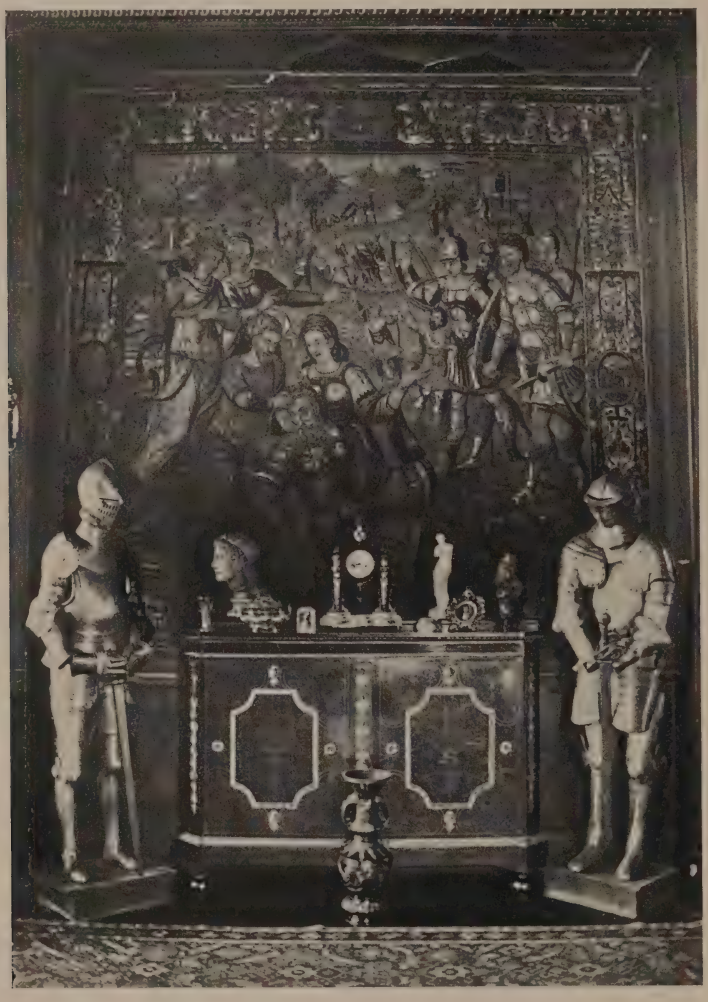
posing, which comes as a complete surprise after the comparatively modest entrance. Ages ago this hall was a council chamber, evidently the place in which the old Masters of Holt received their tenants and the rents for their lands. A stone fireplace almost entirely fills one side of the room. The ceiling is black with time and smoke, and below it runs a frieze of panels done in oils, illustrating Dante's "Inferno," the design showing dark, struggling masses and indistinct human forms. The walls, which, as well as the floor, are of solid stone, and several feet in thickness, are hung with old tapestries depicting the labors of Hercules and the unhappy history of Samson and Delilah. This great hall is representative of several centuries, filled with the products of many countries. The tapestries are from France and Flanders. Old armor of English and Eastern workmanship; coats of mail and engraved helmets hang side by side, with wonderfully wrought silver and ivory guns from Algiers, while a huge tarpon from Florida gives a touch of gilt and silver to the gloom at one end of the room. King John's leather drinking-jack and his iron chest are also to be found in a corner of the hall. A colossal bronze jar, the spoil of some Chinese temple, holds a gigantic palm. Grotesque carnival suits of armor of German origin stand here and there about the room and grin from unexpected corners.

On the left of the vast fireplace, with dim, ancient tapestry for an harmonious background, stands a four-fold leather screen, painted by Angelica Kauffman. The scenes are pastoral; in the foreground Elysian shepherdesses with their delicately attentive swains are indolently tending sheep, while at the back are wonderful trees which never could have existed in nature. Yet they are all the more charming for that, like the trees of Sir Joshua Reynolds. Angelica Kauffman won her fame by a faithful copying of Sir Joshua, whom, besides imitating, she did her best to win. Mr. George Moore says in his "Modern Painting:" "Angelica imitated as a woman should. She carried the art of Sir Joshua across her fan; she arranged and adorned it with ribbons and sighs, and was content with such modest achievement."

But let us return to the hall. The furniture is of heavy carved oak, the chairs are gaunt and comfortless, the cabinets, desks and chests forbidding in their severe splendor. There are rough fur rugs strewn on the stone floor, and above tower the noble heads of moose and caribou from the wilds of North America.

Turning to the left we pass down a long, narrow stone passage, panelled with old Moorish tiles from Spain, rich in gaudy coloring. Armor lines the walls of this passage, at the end of which a long gallery discloses itself. This has been converted into a sitting room for modern comfort. It is panelled almost to the ceiling in dark oak,

obviously robbed from some church. Here again we find a large stone fireplace, filled with soft, flakey ashes, which have probably been there for generations. Let into the wall above the mantle is a delightful marble bas-relief portraying Neptune with his tritons and nymphs disporting themselves in foamy waves. This was prob-



GOBELIN TAPESTRY IN THE LONG GALLERY.

ably brought from Italy at the beginning of the century when everything Italian was *de rigeur* in England, just as now everything French is indispensable in a fashionably furnished British house.

Passing on we reach the state apartments, blue walled and panelled in black and gold, hopelessly uninteresting and modern, breathing an execrable taste in decoration which prevailed some

thirty years ago. But the apartment is redeemed from entire mediocrity by the beauty of its fireplaces and the charm of its arched stone windows. The fireplaces are three in number and made of curious carvings from Brittany. Fluted columns and carved panels reach from the mantleshelf almost to the ceiling. In the centre, let into panels, are two wonderfully good old Dutch pictures. All the arrangement of these fireplaces, though modern, is beautiful and unique in its conception—and provided a thing be beautiful, what matter to which period of art it may owe its origin?

The two paintings are of doubtful origin, but clever in design and execution. They are really beautiful pictures, full of brown shadows and tender backgrounds.

Unfortunately for us, most of the old Nevill portraits were sold and passed into strange hands at the time of the sale of the estate. All the family papers were destroyed too—an irreparable loss, as we can now know little of the real and intimate history of the inmates of this old house. The Nevills, it seems, never wrote memoirs, which is still a greater pity; everybody loves memoirs nowadays, even though they be untruthful ones.

The long gallery to the left on the upper floor was once lined with family portraits and delicately painted miniatures. The gallery, with its graceful arched ceiling, which, like the rest of the house, is rich in oak carvings done in scroll design of vine and grapes, still exists; but the Nevill pictures are gone to grace strangers' walls elsewhere.

Of all the interesting counties of England, Leicestershire and Northamptonshire, or what are known as the midland counties, contain, perhaps, the most beautiful old houses. Here are the really ancient houses, not those erected in the seventeenth century to receive a royal visit from Queen Elizabeth, like Hardwick and Chatsworth; nor yet given to some favorite by Queen Anne, at a later period, like Blenheim and Burghleigh; but ages before, as far back as the thirteenth and fourteenth centuries, in ruder times, before sovereigns paid state visits to their favorites. These houses are all built of lovely gray stone, and many of them were monasteries before Henry VIII. drove forth the monks and disestablished Catholicism. His favorites were rewarded by the gift of these charming old places whose refectories became the rioting halls of warriors. The impression they give is still grave and monastic, an impression extraordinarily enhanced by their architecture, which, though beautiful, is solemn in the extreme.

But I am taking a look into the serious past, and am forgetful of my intention to tell you more of Nevill Holt. Let us make a trip to King John's tower. How darkling and treacherous that sounds! As one ascends the narrow, tortuous staircase, he has visions of all

sorts of dark deeds and unholy crimes committed during the Middle Ages. At the top of the stone staircase, worn by the tread of iron-clad feet, is a landing just large enough to permit one person to stand on it at a time, and here are two curious doors bound with iron, one directly at the top of the stairs and the other to the left.

Pushing open the one to the left a great space right under the gabled roof is dimly perceived, lighted only by the uncertain gleams admitted from the open door. The tower is a labyrinth of huge worm-eaten beams and rafters. It was, without doubt, a hiding place at some remote period and may have been used as a dungeon, although the stone dungeon in the cellar would seem to have been sufficient punishment for any offender. The other door being opened, a small square room reveals itself, lit by a tiny window looking on a pointed roof, not three feet from the aperture. The walls are of solid rock and bear many curious inscriptions, some in Latin, others in old English. Part of this work is attributed to King John, who fled to Holt during one of his many difficulties with his subjects, was concealed by his friends and allies in this little square chamber for many days. Judging from the inscriptions he must have beguiled many a weary hour with his stone cutting. It seems to have been a mania with imprisoned sovereigns to perpetuate themselves by such means. The only way King John had of taking the air was to creep through the diminutive window to the roof, and this could be done safely only at night, after receiving signals that he might venture out without danger to his person.

Without family papers to consult, the task of rendering the history of an old house either veracious or interesting is almost an impossibility. But Holt is not without historical interest, although no actual record remains to us now. In besieging Rockingham Castle, Oliver Cromwell took possession of Holt, using it as a convenient position from which to conduct his operations.

The Nevills appear to have been from the earliest times a people of great daring, personal bravery and devotion to religion. So strong was their sympathy with the Roman Catholics that they actually gave assistance in the development of the gunpowder plot, which, had it succeeded, would have changed the history of England. Between the Catholic houses of Holt, Rockingham, and Stoke Dry, all three miles apart, subterranean passages are by some believed to have existed, by means of which the conspirators and their confederates visited each other, thus enabling them to develop their plans without danger of detection. I have grave doubts, however, of these famous underground passages, since to reach Rockingham from Holt meant tunnelling under a small river, the Welland, a feat which in those days would have been practically impossible to accomplish.

One of the most interesting features of this curious house is the small secret chamber, discovered only some forty years ago. The discovery happened in the following manner: A small pane of glass over the bow-window, of which I have already spoken, caught the eye of some inquisitive person; curiosity being aroused, queries were advanced as to what apartment this miniature window belonged. No one knew; so to solve the mystery, long ladders were brought. Through the aperture a small chamber, completely panelled in dark oak, was disclosed. In the tiny apartment was a winding stone staircase, hardly wide enough for one person, which communicated with the hall below, admission being gained by means of a sliding panel, known only to certain inmates of the house. Without doubt this served as a hiding place for the family priest, who, when the least danger of discovery threatened, would run to the great hall, and touch the hidden, noiseless spring of the oak panel. Then the priest fled up his little stone staircase and was absolutely safe in his hiding place.

This stairway must have seen great service, for the steps are so worn away as to be unsafe in ascending quickly. In all of these old houses are these curious little staircases to be found. The architects of old days must have delighted in building them for the surprise and eternal confusion of mankind. At Holt there are twenty-seven separate and distinct stairways, rendering it unsafe for a stranger to wander about the house alone after dusk.

After the discovery of the secret chamber, search was immediately made for any objects that might give some clue as to when and by whom the room had been occupied. No furniture of any sort or description was found, but on the floor were mildewed papers and a torn letter, yellow with age, bearing the date at the top, July, 1644, traced in a fine, delicate handwriting. The rest was utterly illegible. Some dried bones were also found, covered with dust and damp, but whether human or the bones of some unhappy animal is not known. The discovery of the partial skeleton gives rise to the eternal ghost story, without which no old house seems complete. It is a harmless ghost, but a rather noisy one. People sleeping in the adjoining room occasionally aver that their sleep has been disturbed by curious grating noises, and the clank of chains and armor proceeding from this mysterious apartment; but no one has ever been able to claim the distinction of having seen the spectre itself.

I have not yet shown you the drawing-room. This is truly a house of surprises, for passing through a wonderful door, whose panels are carved with the heads of knights and ladies, and which bears the date 1530, one traverses a short passage, at the end of which bursts upon the astonished vision a long, lofty, arched room which was, in ancient time, a banqueting hall. Unfortunately, the



A CORNER OF THE DINING-ROOM.

minstrels' gallery has been removed. Three great windows at the far end look out upon the lawn and the red-walled garden beyond. No trace of the hall's original purpose remains; to-day it is the most modern of drawing-rooms. When I say modern, I mean in a beautiful sense; it is a *melange* of French furniture, old china, Persian rugs and feathery palms.

On a table at the far end of the room stands a marvelous silver vase, four feet in height, graceful in form and American in workmanship. It was a present given to Sir Bache Cunard's grandfather, over sixty years ago, by the citizens of New York and Boston.

And still there remains the dining-room to be shown. This again, like so many of the rooms, is panelled in dark oak carved almost to

the ceiling. Some fine old sideboards in oak bear the date 1620, and to the left, on a richly carved Dutch pedestal, stands a life-size fox in solid silver, a gift to Sir Bache Cunard from the members of his hunt, when he gave up the hounds eight years ago. The Princess of Wales was the recipient of one about one-third the size from the members of the Norfolk hunt; but with that exception this at Holt is the only one in England, and probably in the world. It is modelled from life, and is perfect in drawing, the whole figure being full of a sense of life and energy.

I could dwell on other beauties, both inside the house and out, but I think enough has been said to convey a vivid idea of the character and charm of this old English abode. As I stand on the terrace in front and gaze at its pointed roofs, delicate spires, graceful towers and lovely stone carvings—the *ensemble* a delightful dream of architecture past and gone—I cannot help thinking that in the old days the artist's motto must have been: "Beauty for beauty's sake."

Maud Cunard.



ANTIQUE FURNITURE IN THE MODERN HOUSE.

IN furnishing a house we are not entirely governed by our own judgment. We may have our own ideas as to what we want, but what we find in the stores is the result of the prevailing custom, and we are obliged to buy, perhaps, accordingly.

Besides this, we are influenced largely by what our neighbors or friends are doing or having. There is a fashion in furniture as much as in dress, and it changes almost as frequently, particularly among the wealthy of our large cities.

This desire from time to time for some new style of furniture and house decoration is not entirely independent of the changes in costume, but it is in a large measure influenced by them. In the early stages of furniture development we find that costume had an effect on the shapes of the chairs, causing them to be wider and deeper to accommodate the dress made of heavy clothes with large folds, and in later times the use of hoops first resulted in the introduction of the chair without arms, and then produced a modification of the arms of the chair whereby the dress did not interfere with them. Court etiquette has also had an influence on furniture, for it at one time dictated what should or should not be the form of seats used during an audience at court. First, seats were absolutely prohibited except for the king or queen, and later stools were granted to the auditors. The number of shelves or steps above the top of the table—or, as we would call it, sideboard—on which dishes were displayed was fixed by court etiquette, each individual having the proper number according to his rank.

These customs were carried from the palace to the castle of the lord, and thence to the peasant's dwelling, each observing them to the extent of his means, resulting in certain fads or fashions.

The desire to imitate the acts of others, together with the love for curiosities, serves to bring into our households many articles which

are not wholly adapted to our use. In mediaeval times the Merovingian kings had furniture imitating that used by the Romans during the Empire. At the present day it is much the same. The wealthy imitate royalty; and the poor, the wealthy. Each man apes his neighbor. If Mr. A. has a Louis XVI. parlor, Mr. B. must also furnish his parlor in the Louis XVI. style. We find many articles of furniture and bric-a-brac brought from foreign lands that are strangely out of place among their more serviceable companions. Most of such articles are bought as curiosities and have a certain value as such, but their use as furniture is not always pleasing. Even this custom has a precedent in most early times; but not to go back too far for an example, we may call to mind that Charles V. used furniture either imported from India or copied from Indian examples. In England during the eighteenth century Chinese articles and furniture imitating Chinese forms were used. The French lacquer work is but an imitation of the Chinese or Japanese.

It is this habit of imitation and love for curiosities which formed one of the seeds from which the modern "craze for antiques" grew. There was, however, another cause.

About a quarter of a century ago the American dwelling was not furnished with any special regard for aesthetic effect. It was understood that certain articles were necessary to furnish a house properly, and it was the fashion to have many of them made of black walnut. There was some attempt at color decoration, but this was usually left to a person who had no especial training or knowledge of true color effects. Perhaps none was needed, for everyone wanted his rooms nearly a monotone; everything was a shade of the same color, without contrasts. Furniture was coarse in detail and often lacking entirely in design, though there was at times a crude attempt to imitate some of the forms of elegant French pieces. No true copy was made, as then the furniture would have been much too expensive for the average person, and no manufacturer had the knowledge or the courage necessary to make furniture which was rationally constructed for its use, and ornamented according to its purpose and value. The entire furniture trade, in fact, household art, fell to a very low artistic level. Many articles of furniture were covered with some sort of tracery, inlay or metal work, under the supposition that it was ornamental because the beautiful model costing five or six times as much had its surface nicely decorated by carving, or chiseled brass work. It did not seem to occur to many that such work was elaboration, and not ornamentation; that it was bad in every way, bad in appearance, bad in workmanship, bad in taste. A few realized this, and if they had sufficient means they employed artists of merit to superintend the construction of furniture made to order.

Several wrote papers or books denouncing the bad artistic sense of the times, and cried for a reform. Among them was Mr. Eastlake, who advanced many ideas, some of which could be followed even to-day with profit. Perhaps he was one of the first to really make an impression on the public. At all events, his work gave a certain impulse to a movement just started towards an improvement, and increased the desire among the public for household goods of a simpler and better character.

Among those who knew how bad in every respect was the furniture of that period were the artists, architects, and those who from observation abroad had some artistic instinct. It was they who first of all gathered from the garret or woodshed some old chair, table or desk which, after cleaning, repairing and polishing, was placed in their rooms to do service.

Why did they do this? Why did they seem so pleased at bringing to light an article that had been discarded as old-fashioned? In the first place, they saw a much better article than the average workmanship of the time produced. It was, perhaps, not so elaborate, but the quality of material, design, workmanship and its truthful simplicity made it appear much more elegant than the showy sham next to it. Whenever an opportunity presented itself such furniture was purchased, till often the whole studio became furnished with it. A studio or office thus furnished, together with the odds and ends usually found hanging about in a place of that kind, certainly gives a pleasing impression as one enters, and this impression is not always destroyed by familiarity.

Then the amateur began to imitate the artist. He, too, bought "old things," but not with that knowledge with which his friend had acted. Though sometimes he bought a good article, it was more the result of accident than wisdom; and as the good pieces became scarce many a poor article was bought under the impression that it was valuable.

But what is good furniture? First, it must be useful, for if not serviceable it becomes merely an ornament, or an encumbrance. Next, it should with its usefulness have a certain artistic quality; but this usually follows as a result if the natural conditions of the problem set before the designer have been followed. When we say artistic we do not mean that it should display some peculiar shape, some odd construction or eccentric ornamentation. Freaks are not artistic. We mean it should be well-proportioned, neither too large nor too small; that it should not only be actualy strong enough to serve its purpose, but it should also appear so. What is more inartistic than to see a cabinet, a table or a chair with legs which appear too slight to hold it up, even though in reality they are sufficiently strong? The form of the article should be pleasing to the eye, and not obtrusive

so as to demand one's attention immediately on entering the room. Yet, when it is noticed it should be such, that the more we see it the better we like it, and it ought never to become an eye-sore, even though it remain in the house a lifetime.

When we say it should have a pleasing form we do not mean that all its lines are to be curved wherever possible, or that any curves need be introduced. There is an impression among many persons that if curved lines are introduced in a design it is much improved. Such curves often bid defiance to all the natural laws of the structure of wood. This is noticeable in much of the Rococo furniture where chair and table legs are so curved that they cannot be made without crossing the grain of the wood, rendering them weak and impracticable, violating the most important principle in a good article of furniture.

Good furniture is not overloaded with ornament, for if highly decorated, especially by carving, it becomes too delicate to stand the hard service of daily usage. Then good furniture must be well made, strongly constructed on rational principles, and well finished. It need not follow some old-fashioned method of joining because an heirloom has stood the ravages of time for a hundred years or more, if modern machinery and ideas have introduced easier and possibly better methods. But it should always be made with a consideration of the materials employed, and how they act under varying conditions of climate.

Finally, it should be understood that the age of an article does not imply its artistic value. It is not good because it is old; it is not artistic because it is old. It may be old, very old, and be both poorly made and extremely ugly. On the other hand, it may be direct from the shop, well made, and a beautiful example of the cabinet maker's art.

It often occurs to-day that a copy of some old article is better than the model itself, for at least two reasons. It is usually better made; and it differs from the model sufficiently to adapt it to our modern usage. Some may be inclined to doubt the statement that it is better made. To those we say, stop and think! They will recall tables with the tops warped all out of shape; drawers with unplaned bottoms shrunken so they are loose or open on the front edge; drawers that stick because they are too loose and twist on the slides, and when closed they have shrunk so as to leave an open joint; the absence of dust panels between the drawers, shaky table and chair legs, etc. These and many more faults will come to mind to those who have had experience with antique furniture. They may claim all these faults are found in modern furniture. But new furniture, rightly made by a reputable manufacturer, will have none of them, not only when first made but even years after.

There are articles of antique make which are quite as appropriate for use to-day as when first made, and may in many instances serve their purpose equally as well. Especially chairs and tables, which even if out of repair when purchased may readily be made over.

A word might be said here regarding the use of veneers. There are those who have an idea all old furniture is of solid wood, especially if of mahogany, and for that reason it is better made. In the first place, veneers were often used in olden times, and in the second place veneered work, properly made, is better than solid wood. A top of a table or a panel of solid wood is sure to warp or crack, but if veneered there is little danger of either accident. Nor, if the veneer is properly put on, will it blister, as we are so often told. No modern manufacturer would consider using solid wood in the places above mentioned, except in cheap work, where native woods are employed.

The color of mahogany is another point at which the amateur often stumbles. Only certain kinds of mahogany have a reddish tone when in the natural color, the majority varying from a bright yellow to orange. With exposure to light and air, when oiled, mahogany gradually assumes a dark reddish color, which often has a beautiful tone. But much of the old work was stained, and the very dark, almost black, color of old pieces of furniture is largely due to dirt and repeated coats of varnish. The modern method practiced by many furniture houses of staining wood with a filler is greatly to be deplored, the filler destroying the fine satin-like appearance which gives so much beauty and richness to the wood, when stains and varnish alone are used for a finish.

We said above that a copy, when adapted to modern usage, was better than the old piece itself. Of course, the character must be retained and all the good qualities, while every modern improvement is added and all the poor parts rejected. We then have a most excellent piece of furniture, and it is for this reason that modern designers employ traditional examples as models.

A cheap, poor imitation of an old article, because fashion calls for that style of furniture, is worthless. The making of an article with seat too shallow and back too upright, with drawers inconveniently placed and too deep, because they used to do so, is certainly wrong. Then there is the copying by some cheap process the elaborate articles seen in foreign museums, in which all the elaboration is retained, but so poorly executed as to lose entirely the character of the original. This is decidedly bad taste. It is not the quantity of ornament that gives beauty to the article, but the quality. The modeling and drawing should be the best, even if we can afford to have but little of it.

Many of the antiques imported to this country are articles that, when new, were not considered good examples of the class they

represent. They are inferior copies or imitations made to meet a certain popular demand. Why, then, should a person purchase such articles at a price that is really extravagant? Is it not better to have a modern, possibly less elaborate, well-designed, artistic example? We have seen homes in which one or more rooms were furnished entirely, or nearly so, with "old furniture." There were the shallow cane, and rush seat chairs with a high back, uncomfortable to sit in, and with loose joints squeaking most annoyingly as we take a seat. Nearby was a table with many turned legs more or less defaced, and the top warped or split. In a corner a cheap "Boule" pedestal with the marquetry breaking loose, etc. Everyone can recall such houses. New in all particulars except the furniture, which is clumsy, broken, and most ill adapted to modern use. Everything seems out of place, and in bad form. There is nothing handsome or even interesting in a house thus furnished, and we cannot help feeling sorry for the owner who has thus deceived himself in thinking he has something unusually good. He has disregarded nearly all the fundamental qualifications for proper furnishing that we have mentioned above, and simply made a junk shop of his home. On the other hand, we have visited houses which were furnished entirely from top to bottom with family heirlooms, and have felt that nothing was out of place, or that there was any violation of good taste. We have been charmed, delighted in every way and inclined to tread softly as we move through the rooms, and to handle each article tenderly, as if it were something to be looked at, admired, but not to be roughly utilized. Possibly, much of this furniture is of the same sort as we have seen in the residence above mentioned, yet the sensation produced on our feelings is quite different. What is the reason of this?

In the latter home everything is in keeping with its furniture. The house itself is nearly if not quite a century old, though it has been kept in good repair, and shows little or no evidence of decay. It is freshly painted and papered, but in strict accordance with the surroundings. The ceilings are low, the windows small and divided into small panes. Even before we enter the door, on approaching the house, we almost feel what we are going to see within; and did we find it filled with a miscellaneous collection of modern cheap furniture, how great would be our disappointment. But here we do not find that comfort has been sacrificed for effect; there has been no pretense or attempt to produce an impression. Everything is adapted to its purpose, even though of ancient manufacture. The stiff-back chair is pushed off in the corner or relegated to the bedroom, where it is used but occasionally. In the sitting room are comfortable chairs that have been in the house a lifetime, but they are in good order, and are all of similar pattern. Around the room are daguerreotypes, Copleys and Stuarts. Even many of the books in the case,

a modern one, by the way, built in the room in strict harmony with the surroundings, are a generation old. It is this harmony of surroundings, this fitness of things, all just what we expect and anticipate, without finding anything which seems foreign to the place or that jars on our sensibilities, which causes us pleasure. There is a certain reverence, possibly, because the objects are several decades old, which appeals to us somewhat, but it is secondarily and not primarily the reason for our satisfaction. Were everything new and the harmony the same our pleasure would be as great. We know this from experience, and can recall many modern residences where architects have directed the furnishings and insisted on its being in keeping with the building. Such furniture may be somewhat similar to antique pieces, but it has been modified, if necessary, to adapt it to modern demands.

What has been said thus far may lead the reader to think that antiques should not be used at all in a modern house. Far be it, however, our intention to give such an impression. Quite the reverse is the case. If an article is suited to the place, let it be old or new, it makes no difference, the result will be pleasing. There are occasions, too, when associations may make it desirable to retain some piece of furniture which is not quite what we would use to-day. But such being the case, it is an easy matter to arrange a place where it will neither be in the way nor produce any discord in the surroundings. Such an instance is very different from lumbering up a building with articles bought at a "second-hand store" because they were old. Then there is the residence of the collector of antiques, who is making a study of their history, perhaps, or something of the sort; we expect to find it filled with a variety of styles and kinds. But even here a little judgment used in arranging will do much to produce a good effect.

One of the excuses given for furnishing a house with antiques is that they are cheap. The cost of old furniture is often no less than new of the same character and quality. Of course, it must be understood that the quality and character of the old piece is to be retained. It is to be constructed in the same manner, and left in a half varnished condition, for antiques invariably are but poorly finished. If an article as poorly made and in as bad condition as much of the antique furniture sold at the shops was sent home to the purchaser, even at the same cost as the antique, it would not be received. No one would think of accepting such rickety drawers, and such poor finish, such patched woodwork.

But to take an antique from the stores and have it properly repaired and finished (by finish we mean varnishing, painting or gilding), is an expensive as well as long process in most cases. Refinishing, particularly, is slow work when properly done, as the old work has to be removed first and then the labor of finishing is the same as

that for a new article. Often the repairing requires taking the piece apart, and putting it together again, making double work. This is what occurs in the majority of cases where antiques are purchased of dealers in such articles, for they rarely make anything more than a pretense at repairing or finishing. The result is that by the time the old furniture is ready for use it has cost at least as much if not a large per cent. more than new furniture of the same pattern.

There are exceptions to the above, such as when one is fortunate enough to be present at a sale of household goods, away from a large city, and the furniture offered for sale happens to be in a fairly good condition. Such instances are not the rule nowadays, however, and the person afflicted with the "antique fever" seldom has the patience to wait until he "runs across" something really good and cheap.

Alvan C. Nye.





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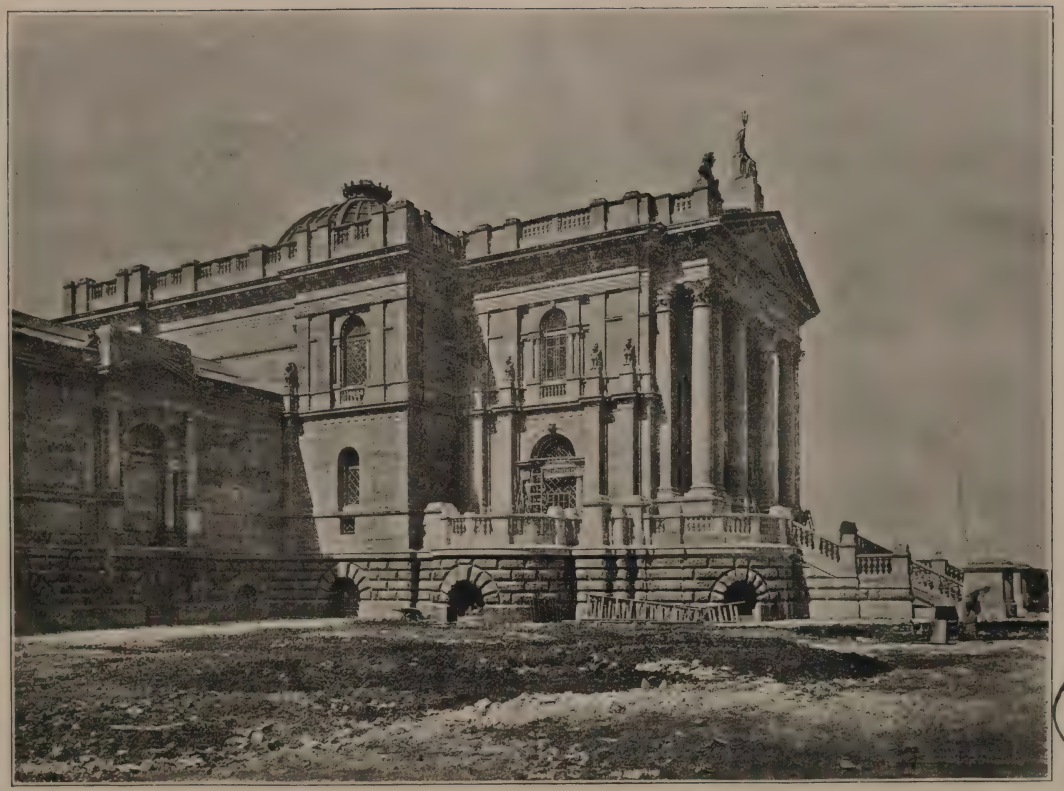
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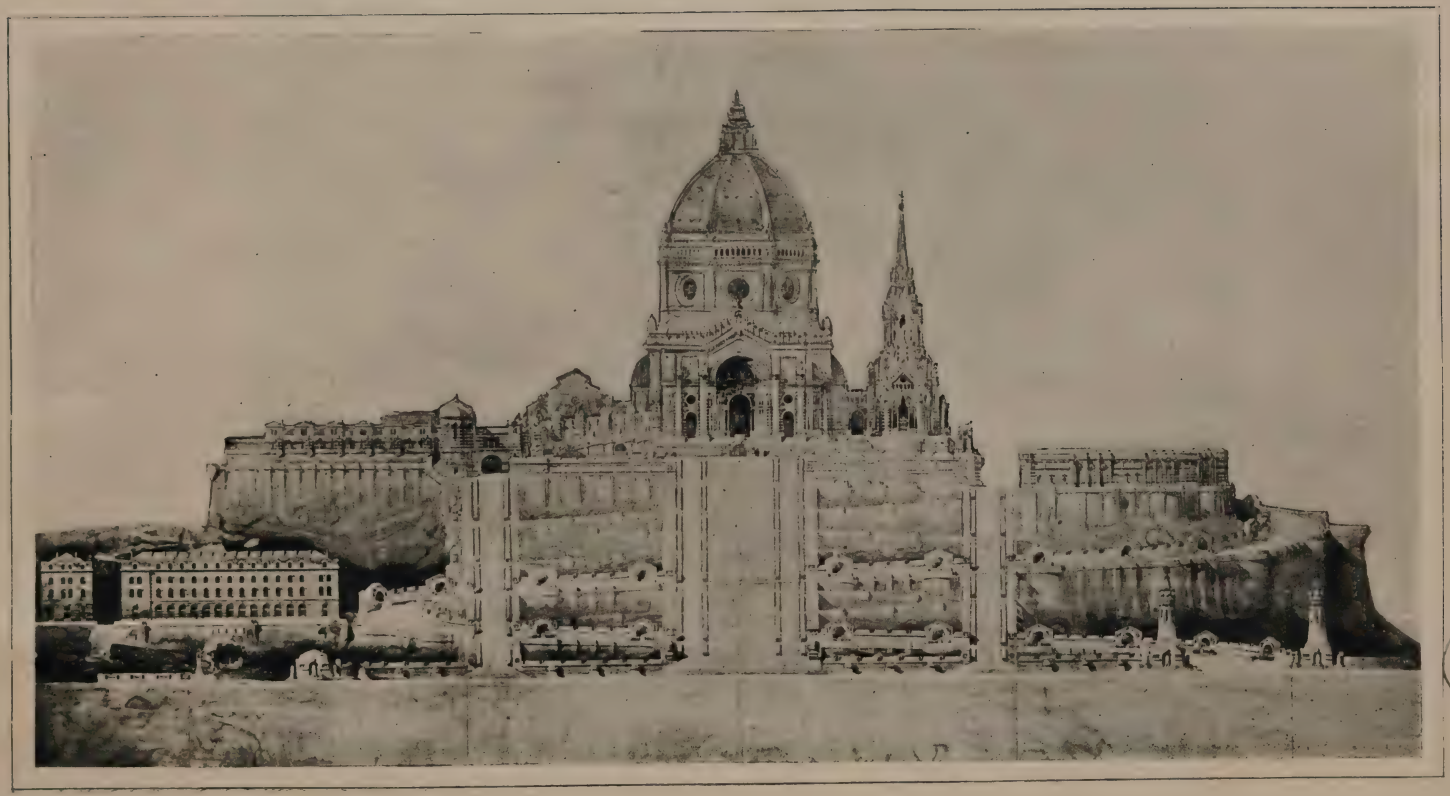


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THE "PRIX DE ROME" 1897 (FIRST PRIZE).

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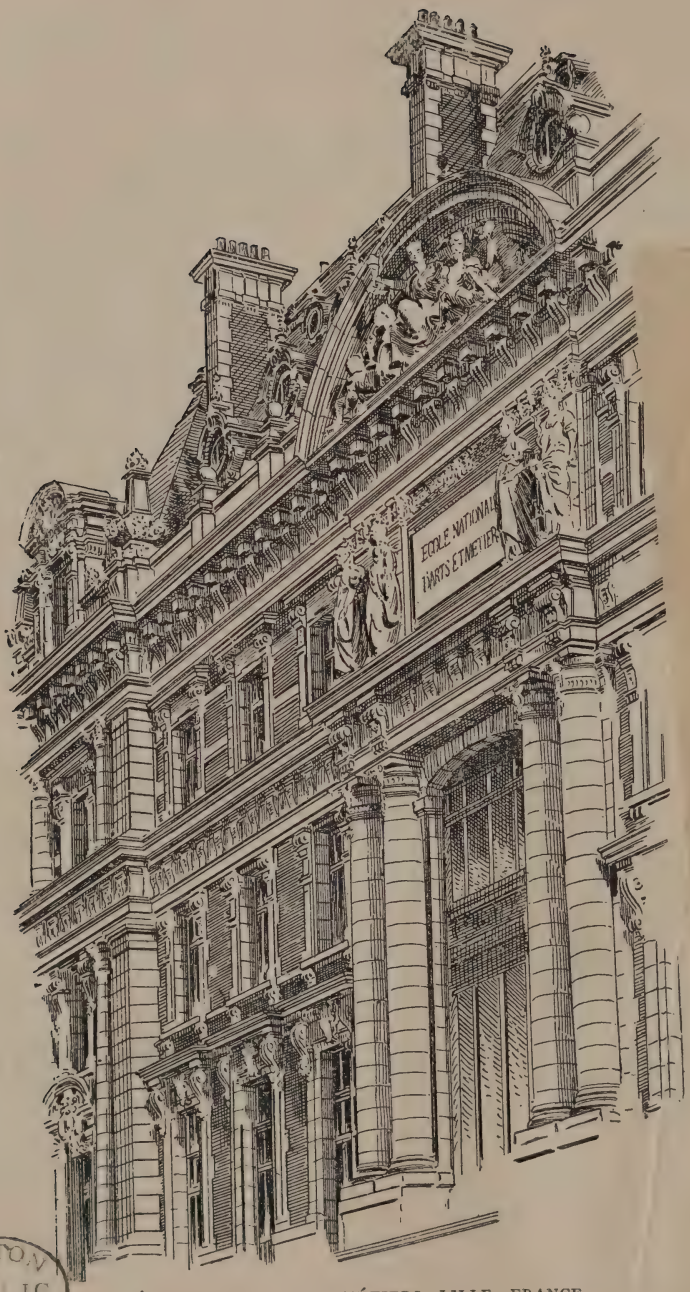
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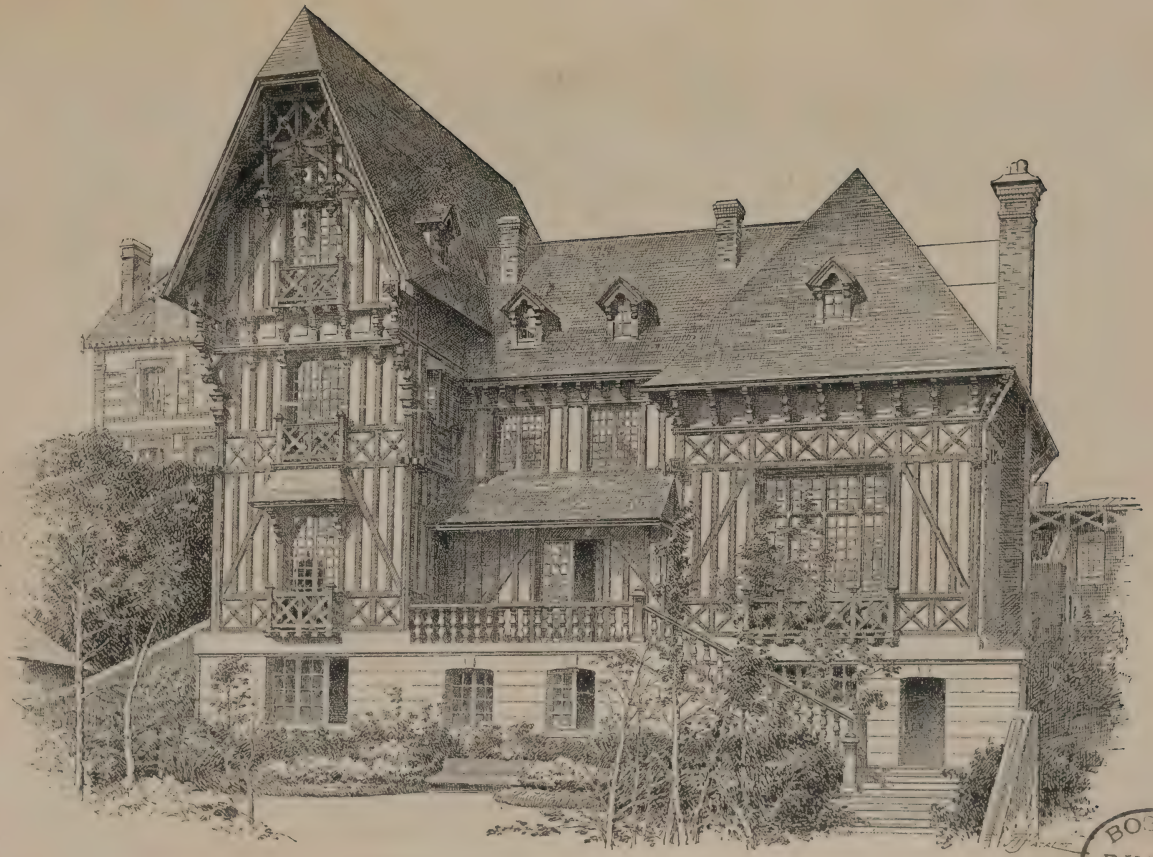
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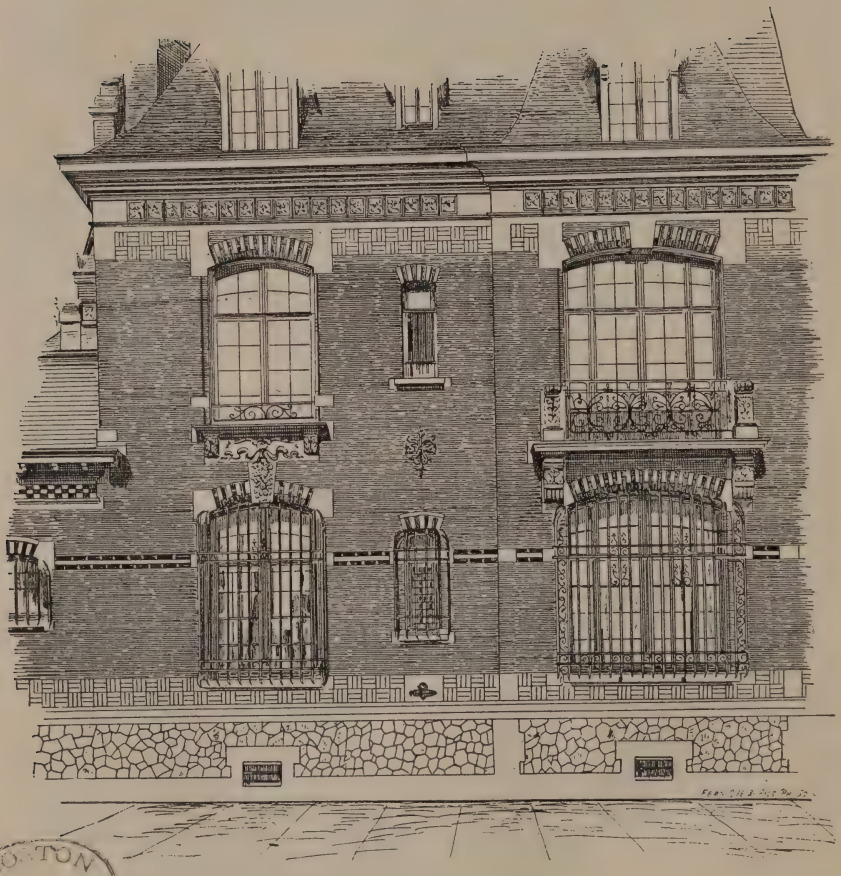
M. Ratigny,



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AN ECHO FROM EVELYN'S DIARY.*

I.

THE diary of John Evelyn, written during the reign of Charles the Second, and covering the years 1641-1705, is a well-known English classic. In this book, under the date of July 27, 1665, the following entry will be found regarding the old Gothic church of St. Paul, which was soon afterward destroyed by the fire of London and replaced by the Renaissance building of Sir Christopher Wren:

"I went to see St. Paule's church, where, with Dr. Wren, Mr. Prat, Mr. May, Mr. Thos. Chichley, Mr. Slingsby, the Bishop of London, the Deane of St. Paule's and several expert workmen, we went about to survey the generall decay of that ancient and venerable church, and to set down in writing the particulars of what was fit to be don, with the charge thereof, giving our opinion from article to article. Finding the maine building to recede outwards, it was the opinion of Mr. Chichley and Mr. Prat that it had ben so built *ab origine* for an effect in perspective, in regard of the height; but I was, with Dr. Wren, quite of another judgment, and so we entered it; we plumbed the uprights in several places." The passage then continues: "When we came to the steeple it was deliberated whether it were not well enough to repair it onely on its old foundation, with reservation to the 4 pillars; this Mr. Chichley and Mr. Prat were also for, but we totaly rejected it, and persisted that it required a new foundation, not onely in reguard of the necessitie, but for that the shape of what stood was very meane, and we had a mind to build it with a noble cupola, a forme of church-building not yet known in England, but of wonderfull grace: for this purpose we offered to bring in a plan and estimate, which, after much contest, was at last assented to, and that we should nominate a Committee of able workmen to examine the present foundation. This concluded, we drew all up in writing, and so went with my Lord Bishop to the Deanes."

The second clause of this quotation throws some additional light on that which precedes. From the first clause it appears that two English architects of the seventeenth century asserted a constructive existence, and an optical purpose, for an outward divergence from the perpendicular in the vertical lines of the nave of the given Gothic cathedral, and this in opposition to the opinions of two other

* All photographs used in illustration were taken for the Brooklyn Institute Survey by Mr. John W. McKecknie, excepting Nos. 13, 15, 17.

experts, viz.: the author of the Diary and Sir Christopher Wren. From the second clause it appears that Mr. Chichley and Mr. Prat were the conservatives of the committee, favoring the preservation of the Gothic building as far as possible, and that Evelyn and Wren were advocates of a Renaissance cupola as superior to the "meane" effect of the Gothic steeple.

In the preceding article of this series (Vol. VII., No. 1) a note has been made of Evelyn's general antagonism to Mediaeval style, and his habit of speaking, during his travels through France, of the French cathedrals as "only Gothic." It is unnecessary to refer to the similar tastes of Sir Christopher Wren and his well-known distinction as the great leader, after Inigo Jones, of the overthrow of the Gothic style in England, and of the taste of which followed the Italian Renaissance fashion of despising and condemning mediaeval art.

We are, therefore, privileged to find, in our quotation, one ground of faith in the views of Chichley and Prat as against those of Evelyn and Wren. The former were evidently better fitted by temperament and sympathy to judge of Gothic work than the latter. In view of the facts to be brought out by this Paper it is not an extravagant suggestion that we find in the views of Chichley and Prat a survival of traditional knowledge regarding a mediaeval practice of constructing "the maine building to recede outwards." If, moreover, it should appear to any readers of this article that its writer has gone too far in asserting constructive intention for the outward leaning piers of certain mediaeval churches, it may at least be said in defence that English architects, and experts in construction, of the seventeenth century have shared this error.

II.

The mediaeval entasis of the pier, on the side facing the nave, described in my last Paper, is occasionally found in piers which lean outward from the nave, either directly from the base or in their upper construction.

These leans are most easily and most naturally ascribed, as they evidently were by Evelyn and Wren, to a thrust of the nave vaulting. That such thrusts have operated in certain cases to produce such leaning piers is probable, and the most natural recourse of the expert is to extend this explanation to all cases.

It was impossible in the limits of a single magazine article to consider those cases of an entasis in the profile of the pier facing the nave in which the problem of thrust had to be seriously debated. Such cases, for example, are those of the Cathedrals of Cremona and Pavia and of S. Ambrogio at Milan, which will be noticed in this article.



FIG. I. NAVE OF S. MARK'S, AT VENICE; FROM THE FACADE GALLERY.
Showing an outward spread of about three feet in the upper portion of the piers. Compare the outline tracing, Fig. 2.

On the other hand, there are a number of churches showing the outward spread in the vertical lines of the piers in which no entasis is found. Among these cases are St. Mark's at Venice, S. Maria della Pieve at Arezzo, and the Cathedral of Trani. The church of Ss. Giovanni e Paolo at Bologna shows a case of the clerestory walls and pilasters leaning outward, into which the entasis enters only to a slight extent.

As the greater includes the less, so it may be suggested that the more remarkable phenomenon, if proven for construction, makes more probable the constructive existence of the less remarkable. Therefore, if the case be proven for the leaning piers, which also have an entasis, and in certain cases it be admitted that thrust has not operated to produce their leans, it will go without saying that thrust has not produced their curves. On the other hand, if the constructive existence of certain leaning piers, without curves, be admitted, this proof will carry with it a probability in favor of the constructive existence of the leaning piers, which also have an entasis.

On the whole, then, this article may be regarded partially as a

supplement to the last one, and partially as calling attention to a still more extraordinary and almost incredible phenomenon.

To nineteenth century minds the practical dangers and inconveniences of building out of the perpendicular are so obvious and apparently unavoidable that even the suggestion that this has ever been done intentionally, in the Middle Ages, savors of extravagance. It may appear, however, from the facts to be brought out by this Paper that the exaltation and enthusiasm of the mediaeval artistic spirit



FIG. 2. OUTWARD LEAN OF THE PIERS IN S. MARK'S AT VENICE.
Tracing from the photographic original of Fig. 1.

found expression and satisfaction in setting at defiance the ordinary laws of physics, as far, at least, as appearances are concerned, in favor of certain optical effects.

What these effects may be is not wholly clear to the writer, in spite of the suggestive opinions of Mr. Chichley and Mr. Prat. On this head it seems wise to consult the opinion of optical and artistic experts after the facts have been brought to light, and it is to the announcement and illustration of the facts that this article will be

mainly devoted. It would, however, be affectation to ignore one obvious explanation, which appears to come within the terms of the interpretation quoted above. In the lofty naves of mediaeval churches, the convergence of lines and walls, due to perspective, tends to an appearance of contraction and narrowness overhead which would be corrected by a slight outward divergence of piers and clerestory walls. These would consequently appear perpendicular, when they really lean outward, and so the correction is naturally overlooked.

III.

As has been usually the case in these articles, the buildings appealed to for proof are in Italy; but, as has also been usually the case in these articles, there are not wanting indications that there are many mediaeval buildings in Northern Europe which will supply additional examples of the given phenomenon. It is my impression that the church of Mont St. Michel will prove to be one of these, but this impression is based on the examination of photographs, which is a very uncertain guide, as repairs of the masonry or indications of settlement and thrust, which instantly strike the eye in a building, are not offered by the photograph. A tilting of the camera might also produce the effect of divergence, and the care taken to avoid this tilting in the Brooklyn Institute Survey pictures will be mentioned again.

Some facts regarding the Cathedral of Glasgow, which has been personally examined, will be mentioned later, and we have seen that the Gothic Cathedral of London was supposed by experts of the seventeenth century to be an example of "the maine building receding outwards."

My first observation of outward spreading piers was made in S. Mark's at Venice in 1870, Figs. 1, 2. Although offhand presumption will naturally ascribe all the irregularities of this church either to carelessness or to the settlement of the foundations, the observations then made of the masonry led me to a contrary conclusion as to the cause of the leaning piers in that church. There was no opportunity to test the conclusions reached for this church until 1895; but meantime, in 1886, the inspection of photographs in the Architectural School of Columbia College led me to believe that the church of S. Maria della Pieve at Arezzo might offer another instance. This turned out to be the case in 1895. Other instances found by the Brooklyn Institute Survey* have just been noted, to which may be added peculiarly convincing cases at Borgo San Donnino, and in the side aisles of S. Eustorgio at Milan and S. Francesco at Pavia.

We will begin our account of this phenomenon by quoting all the

*For a preliminary account of this survey see Vol. VI., No. 1. Other results in three preceding numbers.



FIG. 3. NAVE OF S. MARK'S AT VENICE.

To supplement Figs. 1, 2, 4. The rising curve of the pavement toward the centre of the nave is shown bv this picture. Compare text at p. 27.

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illustrations used in this Paper for the constructive facts, with approximate measurements or estimates of measures, and rapid mention of the argument against thrust, which holds for the given instance. We will then, in certain individual cases, consider more in detail the points which appear to make the suggestion of thrust untenable. If even one case be proven a fact of construction, the reaction of this proof on other possibly less certain cases (or less certain to certain minds) need not be dwelt upon. Considering the number of good cases to be quoted, the undoubted and universally accepted proof of intentional construction in one single instance may be said to settle the whole question and to add a most remarkable and novel feature to our conceptions of mediaeval architecture. Hence the following list:

Fig. 1. S. Mark's at Venice, photographed from the gallery above the entrance in "parallel perspective." This and all following photographs (which were made by our survey) were taken with all scientific precautions necessary to ensure the accurate representation of the amount of deflection from the perpendicular and in such a way that the amount of the lean can be measured from the photograph itself, given the knowledge of any one dimension on a given perpendicular plane.

All photographs in which the camera plate has the slightest accidental deviation from an exact perpendicular will represent leaning lines which are due to a tilting of the camera. Hence Mr. McKecknie's use of a level attached to the camera, by means of which the exact horizontal and the exact perpendicular could be obtained. In addition to this his camera had a "swing-back" attachment of unusual length, in order that high altitudes in church interiors might be reached with the perpendicular plate and without the intentional tilting and consequent distortion which would otherwise be necessary.

Thus this photograph shows with mathematical accuracy what Evelyn has described as "the maine building receding outwards." The piers and upper walls of the nave lean outward and are out of perpendicular to the extent of about eighteen inches on each side. Mr. McKecknie's estimate of the total outward divergence of the two front piers in Fig. 1 gives the amount of 2.90, feet and decimals, or, approximately, three feet.

Fig. 2 is a diagram tracing from the photographic original of Fig. 1. Without such a diagram the facts are as easily overlooked in a photograph, as in the original buildings.

The preliminary argument against the suggestion of thrust in Fig. 1, is that an accidental spread of three feet in these piers and walls would have resulted in the disintegration of the arches supporting the dome and the downfall of the building. Even were such



FIG. 4. NAVE OF S. MARK'S AT VENICE.
Showing outward lean of the right pier.

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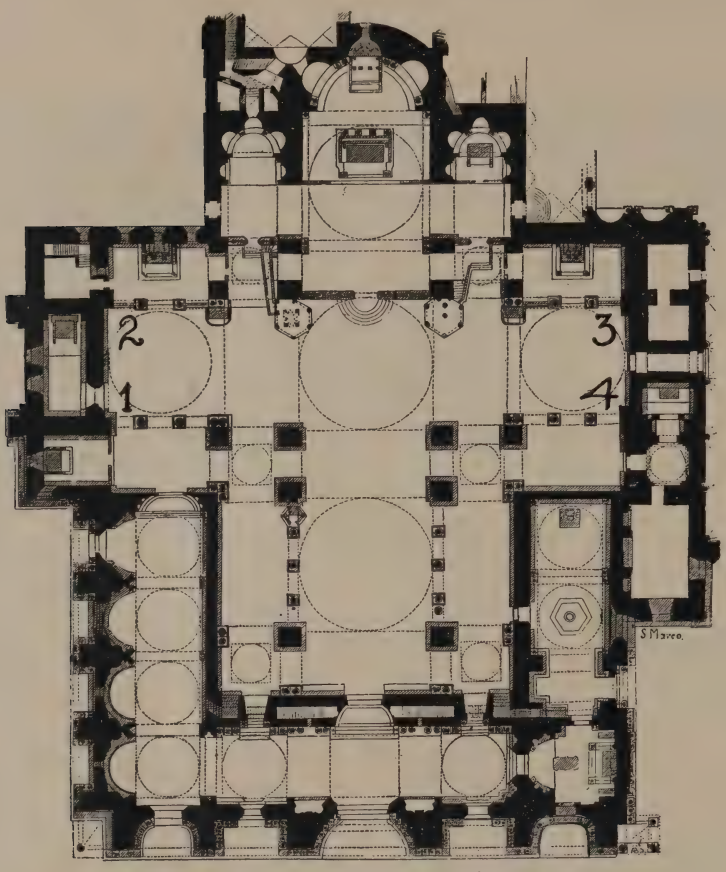


FIG. 5. GROUND PLAN OF S. MARK'S AT VENICE.
Showing the conditions of thrust in the nave piers and at the angles 1, 2, 3, 4.

a downfall escaped, the destruction of all the ceiling mosaics would have been inevitable in case of such fissures in the upper masonry as this spread would involve. These ceiling and dome mosaics notoriously in many instances, and aside from obvious and well-known restorations and exceptions, go back to the time of original construction and original decoration. The proposition that so considerable a yielding of the supports should have taken place before the mosaics were undertaken, without any subsequent movement having taken place, seems hardly tenable.

Fig. 3. View of S. Mark's at Venice, taken from the pavement to supplement Figs. 1 and 4, and showing the outward spread of piers and wall surfaces, especially on the right. In Figs. 1, 3 and 4 the chains of the chandeliers offer a series of natural plumb lines and measurements can be taken from them at various points on the pictures to illustrate the amount of outward leaning away from the perpendicular.

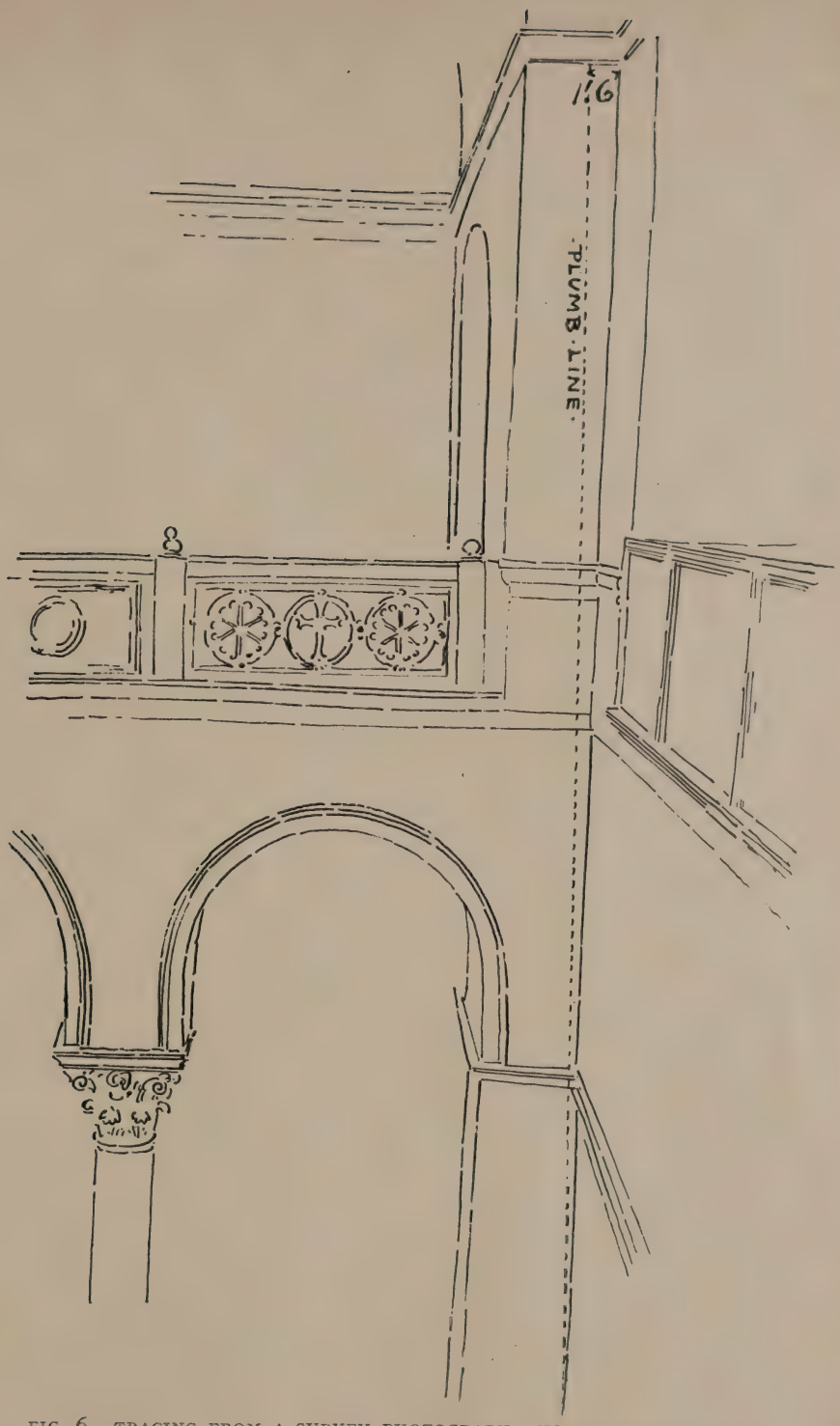


FIG. 6. TRACING FROM A SURVEY PHOTOGRAPH; NORTH TRANSEPT OF S. MARK'S.

Taken from the gallery at 2 and looking toward 1, in ground-plan, Fig. 5. The Survey has similar photographs for the angles 2, 3, 4. The masonry casing is intact, ancient, and closely fitted, and is shown in detail by these photographs.

Fig. 4. View of S. Mark's at Venice, showing the lean of the pier at the right of the choir railing, and of the engaged column beyond and above that pier, which supports the arch there spanning the church. The facts are more easily seen in the 8x10 photographs than in the reductions to page size. The Brooklyn Institute owns enlargements to 18x22, which are still more available illustrations. The Survey has exhibited at Liverpool and in Brooklyn 200 enlargements, including these and other refinements.

Preliminary arguments against the supposition of thrust at these points are: (a) The capital of the mentioned column is built to the horizontal, and does not lean over with the column as it would if thrust had taken place. (b) The outward lean of the pier on the right of the choir rail will be obviously to every expert a constructed lean, as far as the casing and profiles are concerned, and the casing masonry here is as old as the completion of the building. (c) The thrust in the gallery is against a practically solid transept wall, with one inconsiderable piercing. See ground-plan, Fig. 5. This ground-plan makes clear that in all the piers considered the gallery thrusts are against practically solid transept walls, whose resisting power is not affected by the inconsiderable piercing arches, as seen in Fig. 1.

Fig. 6. View in the left (north) transept of S. Mark's, looking west, toward the piazza. The point represented is marked 1, on the ground-plan, and the view is taken from the gallery at 2. On the right it shows a wall whose outward lean, away from the centre of the church, was plumbed by the survey as measuring a foot between the gallery rail and the pavement. The estimate for the entire lean as 1.6, feet and decimals, is a computation of Mr. McKecknie's.

Preliminary argument against the supposition of thrust: (a) In the given case there is no force to exert thrust, on the face of the right lower (north) wall which leans north uniformly, from 1 to 2, in ground-plan, Fig. 5, and this outward lean of the wall is connected with a corresponding lean of the piers at the angles (marked 1 and 2 in the ground-plan, Fig. 5). These piers are a portion of the solid transverse walls of the vestibule by which this transept is entered on the north. The survey has photographs showing corresponding facts, as regards the leans, for all four angles of the two transepts, marked 1, 2, 3, 4, on the ground-plan.

Fig. 7. Drawing from a photograph, representing the face of the wall just described and the gallery and arch above it, with plumb lines to indicate another pair of leaning faces in the angles 1, 2, of the ground-plan, Fig. 5.

The conditions of thrust and resistance are represented by the ground-plan. When Figs. 6 and 7 are related to one another for the vertical construction of the angle marked 1 on the ground-plan

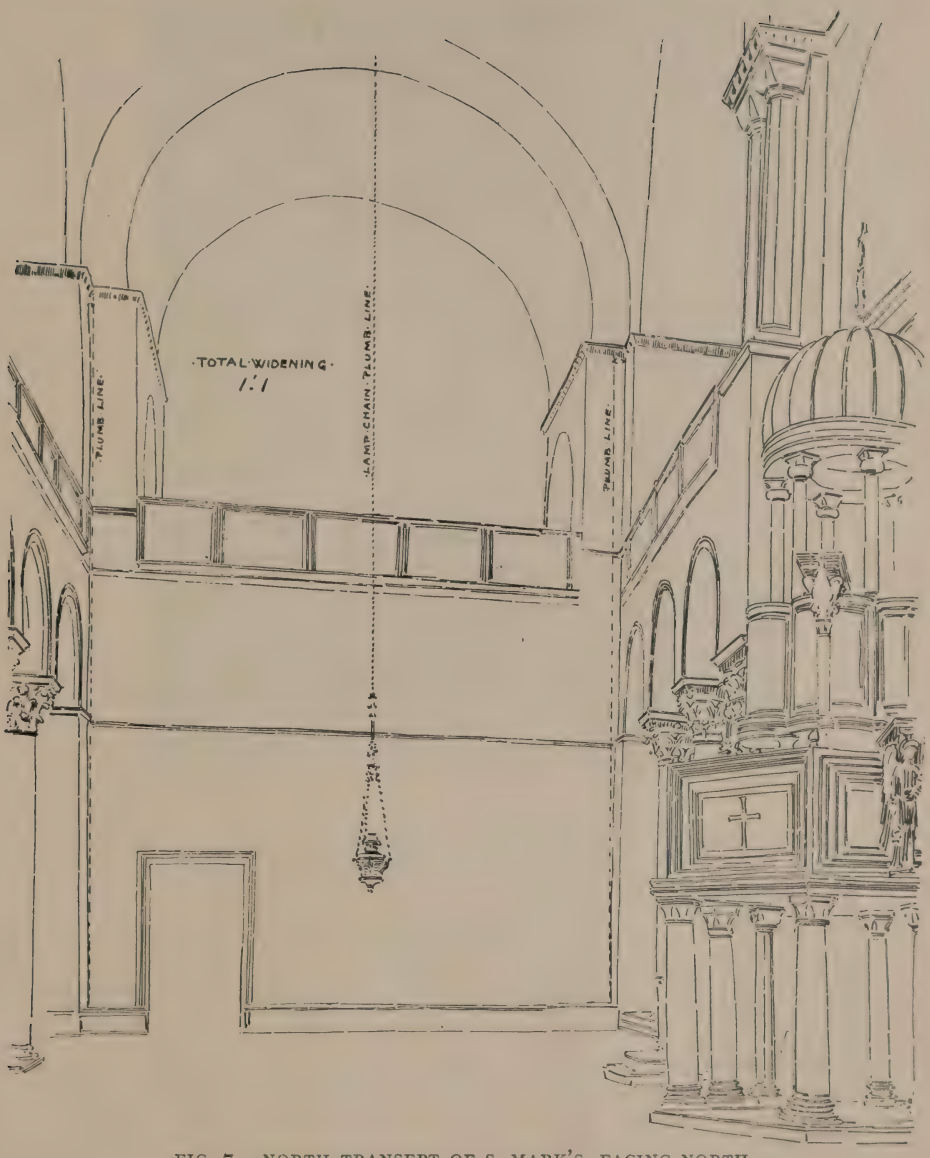


FIG. 7. NORTH TRANSEPT OF S. MARK'S, FACING NORTH.

The wall in face leans north, including the angle piers, which are portions of solid walls in the vestibule. Compare Fig. 6 with ground plan, Fig. 5. These piers also lean east and west as shown here by the plumb lines. The measurement entered above is an approximate estimate by Mr. McKecknie, based on the known width of the transept. The south transept shows the same construction.



FIG. 8. NAVE OF CATHEDRAL OF TRANI.

Showing an outward spread of about a foot in the first pair of transept piers. The thrust is wholly taken up by solid transept walls.

it appears that there is a diagonal outward lean in this angle, and it has a counterpart at the angle 2 of the ground-plan. In other words, we are dealing with a systematic method of leaning outward the piers and walls which support the terminal arches of the transepts; similar facts occurring at the points 3, 4, of the ground-plan, which again shows at these points the conditions of thrust and resistance. If now the facts which hold in the angle 1 of the ground-plan, as shown by the examination of Figs. 6 and 7, taken together, be considered, it will be apparent that a diagonal lean is wholly inconceivable as result of two thrusts which meet at right angles. It is inconceivable for one angle and wholly inconceivable for four angles.

We have undertaken generally to avoid in this Paper theories of explanation, in favor of proof of the facts, but we cannot overlook here the remarkable habitual oversight of the outward divergence of the uprights in S. Mark's. That the eye tends to discount these leans cannot be denied. They would, therefore, seem to be intend-

ed, here and elsewhere, to give an open and spacious effect to the higher parts of the building, and to counteract that feeling of weight and oppression which would result from the narrowing in of the upper lines as due to natural perspective. I conceive that the purpose is to correct this natural effect, which suggests that the walls are falling inwards, and that the walls in consequence, appear perpendicular, when they really lean. Hence the device is generally overlooked and thus in a double sense, it accomplishes its end.

According to this suggestion the interpretation offered by Chichley and Prat of "the maine building receding outwards," that it was so built "for an effect in perspective in regard of the height" should be construed as referring to a correction of natural perspective.

Fig. 8. The nave of the Cathedral of Trani, showing an outward spread or lean, of the piers supporting the nearer transept arch, amounting to five or six inches on each side. This measure is a computation by Mr. McKecknie, based on other known dimensions of the building.

Preliminary arguments against the supposition of thrust: (a) A spread of ten or twelve inches in the supports of the arch would have perceptibly lowered and flattened the crown of the arch. This argument presumes the arch not to have been repaired. (b) The supposed thrust operates against solid transept walls of great depth and is wholly taken up by the given resistance. (c) No supposable thrust could operate from top to bottom of the given pilasters in such a way as to produce the uniform and even deflection from the perpendicular which they exhibit.

Fig. 9. Interior of the Church of Ss. Giovanni e Paolo at Bologna. This church belongs to the complex indexed in Baedeker, under the general title of S. Stefano, and a section of it appears in my article on perspective illusions (Vol. VI., No. 2, Fig. 16) under this name of S. Stefano. The cloister of the Celestines, whose curves in plan were shown in Vol. VI., No. 4, Figs. 19, 20, also belongs to this complex.

The drawing is accurately made over a photograph taken by Mr. McKecknie, and shows an outward spread of the upper pilasters and walls, whose total sum is estimated by him at ten inches; six inches on the right wall and four on the left.

Preliminary argument against the supposition of thrust: The outward leans continue in the side walls as far as the transverse wall at the apse and their lines enter this wall in such manner as to make the suggestion of thrust impossible. The leaning side walls are tied in by the transverse wall and must always have remained in one immovable position.

Fig. 10. The Church of S. Maria della Pieve at Arezzo (republished from the first article of this series, Vol. VI., No. 1, Fig. 2). This

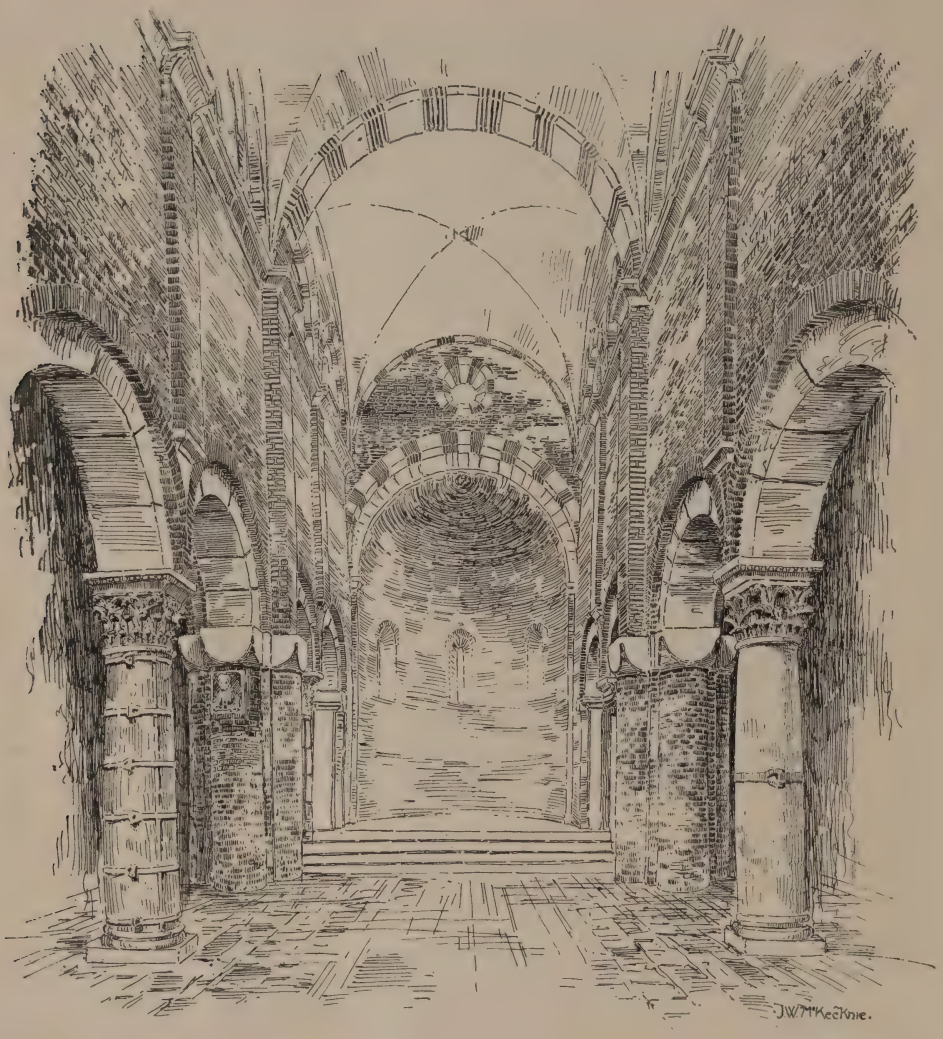


FIG. 9. NAVE OF SS. GIOVANNI E PAOLO, BOLOGNA.

Accurately drawn over photograph showing clerestory walls tied in by transverse wall at the apse, and having an outward spread of ten inches.

view shows a spread in the piers of the nave at the transept amounting (by careful estimate) to not less than fourteen inches on each side in the nearer pair of transept piers and considerably more than this in the farther transept pier on the right.

Preliminary argument against supposable thrust: The given deflection, and all others, in this church, are verified by the local experts of Arezzo as constructive facts, although mysterious to them as regards purpose, and having no counterparts elsewhere within their knowledge.



FIG. 10. THE LEANING PIERS OF S. MARIA DELLA PIEVE AT AREZZO.
Accurately photographed. Compare Figs. 11, 12.

Fig. 11. Another view of the same church illustrating the exaggerated lean of the farther transept pier on the right and also showing the leaning pier on the left. As usual in the survey pictures, this is an accurate representation of the actual facts. The hanging curtain ropes in this and adjacent pictures also offer natural plumb-lines, by which the leans may be tested.

Preliminary argument against supposable thrust. By observing the arch above this right pier, as shown by the preceding picture, Fig. 10, it will be seen that a thrust from it operating as far down as the base of the pier, in Fig. 11, is inconceivable. The pier leans against the stairway, and is built into the raised choir. Fig. 12 is another view of the same church looking toward the entrance.



FIG. 11. THE LEANING PIERS OF S. MARIA DELLA PIEVE AT AREZZO.
Accurately photographed. Compare Figs. 10, 12.

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FIG. 12. THE LEANING PIERS OF S. MARIA DELLA PIEVE AT AREZZO.
Accurately photographed. Compare Figs. 10, 11.

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FIG. 13. S. AMBROGIO, MILAN.

The entasis and lean which hold generally for the main piers are best seen at the choir on the right. Compare the diagram tracing, Fig. 14, for the lean.

Preliminary argument against supposable thrust: The capitals of the piers here seen are built to a horizontal, and do not tilt down as they would have done if the pier had been thrust over. Compare, also, the upper capital in the farther right pier shown in Fig. 11. It is built to the horizontal.

Fig. 13. Interior of S. Ambrogio at Milan, from a photograph, kindly loaned the "Architectural Record" by the firm of Heins and La Farge. Although this photograph was not made for the purpose, it successfully illustrates the facts. The plumbs which I took in this church for the piers at the choir showed a leaning outward of five and a half inches on each side, as measured from the capitals. The entasis described for other churches in Vol. VII., No. 1, is also seen here.

Fig. 14 is a diagram taken from a tracing over the photograph, and showing the right pier at the choir.

Preliminary argument against supposable thrust of the nave vaulting. The given piers lean outward from their bases against a counter thrust of the aisle vaulting and are otherwise so reinforced by surrounding masonry that thrust seems out of question.

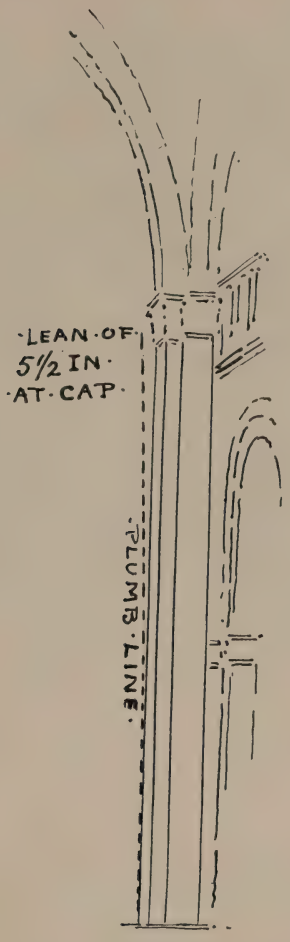


FIG. 14. RIGHT PIER, CHOIR OF S. AMBROGIO.
Showing lean of the pier. Compare Fig. 13.

Fig. 15. Façade of S. Ambrogio at Milan, showing in the upper central arch of the front, the "spread" and also the entasis. The spread also appears in the slender pilasters which frame this arch. There is some new masonry over the arch, but the general condition of the masonry and of the surrounding construction may be held to argue constructive purpose.

Fig. 16 is a diagram from a tracing taken over the photograph.

In San Eustorgio at Milan, the exterior aisle piers lean back five inches against solid ancient chapel walls. In San Francesco at Pavia, the outer aisle piers lean back against ancient chapel walls twelve feet deep.

The facts illustrated by Figs. 13, 14, for S. Ambrogio are very strongly marked in S. Michele at Pavia, both as regards the entasis



FIG. 15. FACADE OF S. AMBROGIO, MILAN.
The entasis and "spread" are seen in the upper central arch and in the adjacent pilasters. Compare the diagram, Fig. 16.

and the leaning piers. Both these churches were examined after Mr. McKecknie's five months' time with the survey had expired, and after he had left Italy, and his photographs are, unfortunately, therefore, not available for them. The same deficiency holds, for the same reason, of the Romanesque church of Borgo San Donnino, near Parma. In this church the constructive stepping back (in the rising direction) of pilasters under the arch spanning the apse is very marked. I have a rough sketch of this detail in one of my note-books.

Fig. 17. Interior of the Cathedral of Cremona. Here, again, Mr. McKecknie's assistance failed me for the reason already given, and I am obliged to use a picture made by a local photographer after my departure, which was subsequently mailed to me. This picture shows the usual distortions of ordinary photography, and the standpoint which I directed to be taken in order to illustrate the profiles of the piers and pilasters was neglected, or not understood by the photographer. The picture will, however, make clearer an account of the facts and of the estimates for measures made here. In this church we have a very exaggerated phase of the entasis described in the last article. The piers lean forward into the nave up to their capitals; by careful estimates, about six inches. Above these capitals



FIG. 16. FACADE OF S. AMBROGIO, MILAN.

Diagram tracing to show entasis and "spread" in the upper central arch. Compare Fig. 15.

the pilasters lean away from the nave as far as the spring of the vaulting arches; by careful estimate, about one foot. Potentially, the forward lean of the piers might be due to thrust of the aisle vaultings, although the piers are very massive. On the other hand, two considerations militate against the supposition that the outward leaning away from the nave of the walls and pilasters, which begins above the capitals, can be due to thrust of the nave vaulting. The pointed arches of the groined ceiling are in magnificent preservation, and very sharply defined to the eye. They are without the least indication of such a settlement or depression at the crown as a spreading apart of two feet in the upper walls of the church must have involved. A second consideration against an outward thrust of the nave vaulting is that this thrust could not have operated against the counter thrust of the aisle vaulting as low as the pier capitals, at which point the backward or outward lean begins. My note-book contains the



FIG. 17. INTERIOR OF CATHEDRAL, CREMONA.

To assist descriptions in text. Made for the author in Cremona, but not a Survey photograph.

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remark that although these lower piers lean into the nave their capitals are built to a horizontal.

The tie-rods which appear in the picture of S. Ambrogio (Fig. 13) are probably modern. They indicate a dread on the part of a modern or Renaissance restorer of disintegration from thrust; which dread may have been wholly due to a misapprehended appearance of spreading in the piers. It is such a resort as would have occurred wise to Evelyn and Wren in the old St. Paul's. There are indications in many Italian buildings of Renaissance or modern repairs which have not been actually needed or not to the extent supposed. I am not familiar with the records of the Cathedral of Glasgow, but it has occurred to me that the removal of the vaulting here may have been prompted by threatening appearances which were at least partially due to construction. This Cathedral offers an instance of an outward lean in its clerestory piers, but the vaulting has been removed. It is a curious fact that the buttresses on the exterior of the façade lean outward in lines corresponding to those of the interior piers, excepting in one right buttress, which has been restored above a certain height and there tends to the perpendicular in the modern masonry. It is inconceivable that any forces of thrust operating from the old vaulting within, should have extended through the façade into these exterior buttresses, which repeat the same lines of divergence; and, in so far, we have a hint that the inner leans are also constructed.

IV.

Admitting the possible irrelevance of these last remarks and returning to our more valued, because more carefully examined, Italian examples, it may be in place to say a few additional words about the question of thrust in general, not as an expert, but in record of the views of such.

The opinions of architectural experts do not seem wholly in unison as to the degree of movement which the piers of a church may experience without palpable evidence of strain or dislocation. Theoretically speaking, no pier of stone masonry can be bent by thrust without an opening and cracking of the joints on the one side and without grinding of the joints on the other side. Positively no arch or vaulting can cause by its thrust a movement in piers without itself settling at the crown and without tending to become insecure through fissure. It is held by some experts that a pier, composed of small materials joined by a good deal of mortar may undergo considerable bending without palpable dislocations or breakage, and there is no doubt that an arch or vaulting may settle to some extent without falling in. The Cathedral of Vezelay, which I have not personally examined, would appear to offer an instance of this.

The following points are, however, to be carefully insisted on, in anticipation of the time when engineering experts shall have passed on the facts in face of the individual buildings here quoted; and some time may elapse before this is done for all of them. It is conceivable that some piers built up of small materials and using much mortar may bend or lean outward without palpable cracking or parting. It is conceivable that some arches or vaultings may settle without falling in. But is it conceivable that the facts should be as I have shown them to be in so many buildings, and that none of them should show parting or grinding of joints or settlements at the crown of the arch? Our survey in Italy was most conscientious in looking for the signs of dislocation and of accidental masonry movements and in noting the signs of modern repairs. Indications of accidental masonry movement were only found in one case (as regards the spreading piers or the entasis); viz.: in the piers of the unfinished portion of the Siena Cathedral, which have consequently been omitted from my list. I have also omitted quotation of some cases of the entasis in piers, such as are offered by S. Trinita in Florence, because the masonry is not of very fine quality, and the sceptic could assert thrust in consequence, without the possibility of positive disproof.

There are many churches in which the use of stucco or paint might conceal the settlements or dislocations of masonry, and there are still other churches whose masonry has been repaired to such an extent that an argument from close-fitting masonry is simply an argument from modern repairs. At Cremona, for instance, the modern coloring and stucco would certainly conceal every indication of fracture, but the estimated measurements here would seem to imply a downfall of the building if the upper leans were not due to construction. Moreover, as stated, the outward lean begins at a point where the thrust comes from the opposite direction.

On the other hand, in S. Michele at Pavia, and in S. Ambrogio at Milan, the original masonry, which is very massive, is wholly bare to inspection.

In advance of closer personal tests and examination, experts are requested to give the Brooklyn Institute survey credit for careful examination and weighing of all these points in every individual case.

The phenomena under discussion are certainly such as to provoke scepticism, and they are certainly such as to demand, as far as possible, a personal examination of the masonry by a number of engineering experts. It must not, however, be forgotten that an expert was expressly employed by the survey to pass upon these questions. Mr. McKecknie is not only an architect and surveyor, as well as a scientilc photographer, but he has been employed in New York by an architectural firm as an engineering designer. I can speak for his

unswerving rectitude, his great personal honesty of character, and his anxiety not to allow any appearances in Italy which might be due to accident to make their way into my list of constructed irregularities. For instance, he has attributed the leaning piers of the Cathedral of Perugia to thrust, although there are no visible indications of it, and I have consequently not quoted this building in the list of good examples. When this cathedral was examined Mr. McKecknie had not seen, however, the convincing cases at Arezzo, Venice, and Bologna, and neither of us were then aware of the fact at Trani, Cremona, Milan, Pavia and Borgo San Donnino. The piers of Perugia were so closely covered by drapery that they could not be examined for parting or grinding of the joints and my memory is that they have also been stuccoed. The maximum amount of lean in the piers of the Perugia Cathedral is estimated by Mr. McKecknie as about eight inches (for one pier).

The points at which Mr. McKecknie was not present with me have been mentioned, viz., Pavia (S. Michele), Milan (S. Ambrogio), Cremona (the Cathedral), and Borgo San Donnino. As to the buildings quoted so far, which we have both seen together at Trani and Bologna, and the crucial cases of S. Maria della Pieve and S. Mark's, his opinion is distinctly in favor of a constructive existence of the given phenomena.

The following opinion has been furnished by Mr. McKecknie for these last two churches:

"The piers in S. Marco at Venice are of such tremendous size and such ample strength that it seems almost impossible that they should have been spread apart by the arches which they support. The dome is so small comparatively that its weight is not a large factor. If it be assumed that the spreading of the piers was occasioned by the uneven settling of the foundations, due to the tendency to gyration, then it is hard to understand how the building has stood at all.

"In the church of S. Maria della Pieve at Arezzo the spreading of the piers seems to be intentional with the builders of that queer church. The mason work is laid with great skill. The piers are of great strength, and the thrust is carried over to the heavy side walls. Had this lean in the piers been caused by the superimposed weight there would certainly be some evidence of displacement in the finely cut stone work. Moreover, this feature of spreading, or widening out, is again employed in the plan of the lines of columns of which these leaning piers form a part (Fig. 19). Here there cannot possibly be any suggestion of displacement, and still the phenomenon is not less strange, not easier to explain away, than the lean of the piers."

JOHN W. MCKECKNIE.

V.

It is a very general and a very natural presumption of visitors to Venice that its buildings are unusually exposed to the movements due to weak foundations and to settlement after erection. The great wave lines in the pavement of S. Mark's are, to a casual observer, sug-

gestive of such movements in this church. In Fig. 3 the photograph gives some effect of the great rising swell of the pavement between the nave piers. Its downward dip may be seen in this picture on the left of the pulpit which stands on the left of the choir rail. The same downward dip is seen at the same point in Fig. 4, which also shows the beginning of the corresponding downward dip under the other pulpit at the right.

In Vol. VI., No. 4, pp. 503, 504, there will be found an extended quotation from Street's "Brick and Marble in North Italy," giving Mr. Street's reasons, from his examination of the crypt, for supposing that these wave lines of the pavement are constructive, and asserting that S. Sophia, at Constantinople, once had the same peculiarity. My own view coincides with his. Observations were independently made by me in 1870, long before my acquaintance with Mr. Street's book, to the same effect, and were announced at the Century Club, New York, verbally and by printed syllabus in 1879. That the minor and irregular depressions found all over this pavement are due to accidental causes is certain, of course.

Offhand examination or offhand knowledge of S. Mark's pavement may certainly suggest that the foundations of the piers have yielded to pressure since construction. It is, therefore, a peculiarly important fact that Mr. McKecknie (who did not examine the crypt and its ceiling) holds the main wave lines of the pavement to be due to settlement, differing on this head with Mr. Street, and with me. But he holds that the piers have not settled, and asserts that their inclination is not related to the deviations of level in the pavement. It is wholly conceivable and wholly probable that more attention was given by the builders to the foundations of the piers than to the substructure of the general pavement, and the fact should, therefore, be emphasized that the expert in construction employed by the survey holds the deflections of the pavement to be accidental, and, notwithstanding, holds the inclination of the walls and piers to be intentional.

An opinion from an expert in thrusts is naturally based on computing the visible amount of thrust and the visible amount of resistance and comparing the two forces. There is no doubt that the amount of resistance offered by the construction of the galleries of S. Mark's to the thrust of the nave arches and cupolas is unusually strong. (See Fig. 1.) It is also clear that the two pairs of piers on both sides of the transept lean against transept walls which would be regarded by an expert as solid walls for purposes of resistance.

The following points are offered as my own and not as those of an expert in thrusts:

Whatever be the facts regarding the pavement they are not in question as effecting the piers. If Fig. 3 be examined it will be seen that the piers on the near side of the transept are erect, as far as the

spring of the arch. (Compare the natural plumb lines offered by the chain of the chandeliers.) By comparing Figs. 1 and 3, it will be seen that the outward divergence, on the near side of the transept, begins at the spring of the nave arches and has, therefore, nothing to do with causes affecting the foundations. On the other hand, if we examine Fig. 4, the spread of the piers at the choir rail begins lower down, but here the lean is against the thrust of an adjacent arch on the right (compare the left side of Fig. 4) and the profile of the pier curves back against this thrust.

We need not repeat here the facts already noticed for this right pier in Fig. 4, regarding the cutting of the casing blocks, the horizontal position of the capital, which does not tilt over with its leaning column and the resistance of the transept wall of the upper story; but it may be well to add to these points that in the interior there have been no repairs worth mentioning, of the ancient Byzantine casing, or of the ancient Byzantine details (below the mosaics, which have themselves been extensively repaired).

As the leaning faces and surfaces are found in all parts of the interior to an extent which would render complete descriptive illustration the affair of a volume, this general point may be made for all the interior leans of S. Mark's. There is no point at which any parting or cracking of the closely-fitted interior facing is visible. This interior casing is as old as the building. Therefore, it is necessary to assume, on the theory of accidental movement, that all the movement took place before the casing was put on and that no movement has taken place since that time, which would be a very odd state of affairs for as rickety a building as S. Mark's would prove to have been on the theory of accidental movement.

These remarks also hold of the casing beneath the gallery curves, described in Vol VI., No. 4. A direct movement downward, of the piers *might* have caused these curves, but an examination of the cutting of the casing blocks will show that there has been no movement of the piers since the casing was put on, and the casing is as old as the building. (Observe the angles in Fig. 18, Vol. VI., No. 4.) The survey has at least six similar photographs which are much more convincing in their original dimension than in the reduced size of the magazine page.

It would be a mistake to overload a good argument with too many details. Probably our best appeal is a return to Fig. 1, to observe again that many portions of the arch and dome mosaics date from the completion of the building and bespeak a strong and sturdy survival, since that time of the original walls and surfaces—such a survival as an outward accidental divergence of three feet in the upper supporting walls would have made impossible. There is no such sinking in the crowns of the arches as this divergence

would have caused, supposing even that the ceilings and domes could have maintained their existence after it had taken place, which appears impossible.

Some few additional remarks may be made as to the general stability of other churches in Venice. As to pavements, there is only one of all the old churches of Venice which shows a disruption due to settlement. This is the eighteenth century church of the Gesuiti. Making all allowances for occasional repairs and restorations this fact is significant when we come back to the pavement of S. Mark's. No deviations from the vertical have been observed in walls or columns at Torcello or Murano, whose old churches are about as old as S. Mark's, and whose church foundations are presumably equally insecure, and are certainly laid in the same kind of soil. The same observation holds for the old Gothic churches of Venice, the Frari and Ss. Giovanni e Paolo. It may be added as another negative argument that the soil of Ravenna is very marshy, but that the church of S. Vitale, which is four hundred years older than S. Mark's, has perfectly erect piers.

As to the question of the strength of the foundations of S. Mark's and their general ability to resist settlement under the conditions of frequent inundations as high as the church pavement and the supposably unstable soil beneath, there is still something to be said. The argument is indirect, but is of telling force.

In 1885 an American architect, Mr. C. H. Blackall, made a critical examination of the foundations of the Campanile of S. Mark's. Excavations were made which laid bare the foundations, and the results were published in detail in the "American Architect" for August 29, 1885.

Mr. Blackall estimates the Campanile to be "one of the heaviest buildings in Europe for its size," the height being 322 feet, and the estimated weight 13,000 tons. The stone foundations rest on a raft composed of a double layer of logs, one row laid crosswise on the other. This timber was found to be in good preservation and not to have rotted. Below this was the piling proper. The piling directly under the foundations was surrounded by an exterior fencing of piles, at the same level, wholly separate from the foundations and bearing no weight whatever. By comparing the height of these exterior piles with those supporting the Campanile, as well as by examining the foundations proper, it was found that the latter had experienced no settlement whatever. "The foundations have stood the test for centuries without yielding an inch." Mr. Blackall's advices as to the soil of Venice are that it consists of a stratum of heavy black clay, "quite firm" in consistency, ranging from a few inches to a hundred feet in depth, resting on a substratum of sand. He holds the secret of piling in Venice to have been not to carry it through to

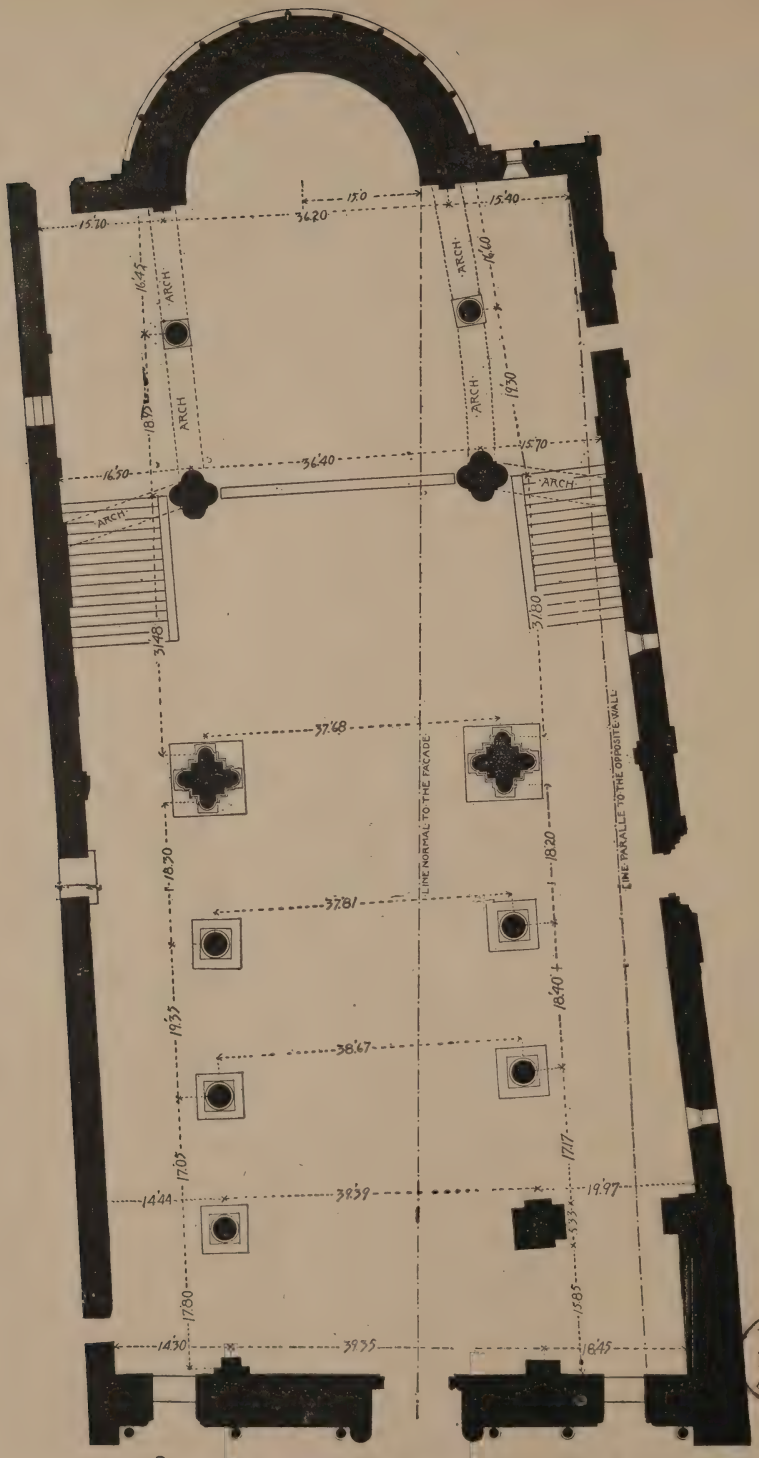
the sand but to confine it to the clay, which appears to furnish in itself a very stable support. In the case of the Campanile, Mr. Blackall considers the use of the exterior fencing of piles to have been that of binding the clay around the foundations and the piling itself is held to have served the use of compacting and strengthening the clay. He reports the stone foundations of the Doge's Palace to have been laid on a mud raft, composed of two horizontal layers of larch logs, placed crosswise, without any piling beneath, and supposes this method to have been due to the presence of a thinner layer of clay, in which piling would have been inadvisable, because it would have gone through to the sand. Mr. Blackall makes no remarks on the foundations of S. Mark's, but we have already quoted Mr. Street's argument as to the pavement, based on an examination of the crypt. It follows, however, from Mr. Blackall's investigations, that the supposably unstable soil of Venice has sustained the tremendous load of the Campanile for centuries without any settlement whatever. It is reasonably certain that no less care was paid to the foundations of the famous church and positively certain that the pressure on any pier of the church is a mere fraction of that which holds for the Campanile. All of which goes to show, and especially in view of the stability of the adjacent Doge's Palace, which has no piling whatever, that the supposed weakness of the foundations of S. Mark's is a pure myth and a wholly unsupported assumption. Mr. Blackall adds that "for more modern Venetian buildings" than the Doge's Palace and the Campanile, "the work is not as careful." To this fact we may ascribe the occasional yielding of foundations which may be noticed along the canals in some of the Venetian Renaissance palaces, which nowhere, however, assumes any alarming proportions. This may also explain the settlements in the pavement of the Gesuiti.

The fact that the Campanile of S. Mark's "has never sunk, even by a hair's breadth," is reported by Vasari in the life of Arnolfo di Lapo, and is there attributed to the able construction of the foundations. Is it likely that the famous church was less carefully founded? In a recent meeting of the Architectural League of New York, which I was privileged to attend, the use of piling in Venice was mentioned as a natural cause of settlement, to which one of the ablest engineers in this country responded that this would be a very good cause why a building should not settle.

VI.

Following this more detailed examination of the divergence of piers in S. Mark's, from the perpendicular, we will return to S. Maria della Pieve at Arezzo.

My first visit to Arezzo was made, in 1895, in company with my



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FIG. 18. GROUND PLAN OF S. MARIA DELLA PIEVE AT AREZZO.

For a number of similar plans see Vol. VI., No. 3.

nephew, Mr. Nelson Goodyear, while Mr. McKecknie was developing negatives in Naples. No observations of leaning piers in Italy had been made up to that time, aside from those in S. Mark's in 1870, and my visit was inspired by the memory of a photograph seen in 1885, in the Architectural School of Columbia College.

My nephew, who has since completed a course of architectural study in Paris, had already made serious studies for the architectural profession and consequently had at this time some pretentions to pose as an expert in construction, and had been of great service by his discovery of horizontal curves in S. Agnese at Rome, and several other buildings. As we entered the church I said to him: "I don't want to look at those piers, go you and see what they look like." My feeling was that I might be a prejudiced observer on the question of construction. The report was forthcoming in a few moments, to the effect that the phenomena were constructive. This examination was followed by an interview with the Sacristan of the church, who assured us that the leaning walls and piers were known in Arezzo to be an intentional construction, but for unknown causes. He gave me the name and address of Professor Gamurrini, director (and founder) of the excellent Museum of Arezzo, as qualified to give farther information. This gentleman enjoys a world-wide reputation for his Etruscan researches.

The next morning I presented my credentials from the Italian Ministry of Public Instruction to Professor Gamurrini, who received me most cordially, and invited me to re-examine the church in his company. He had contributed to its repair, and had been intimately acquainted with the architect, now deceased, who had in recent years restored the building. There is much new masonry about the church; the lower courses of all the piers are modern; a suspicious circumstance to one who is looking for evidence of grinding and parting joints near the bases; and there is a great deal of fresh masonry in the arches, which is also a suspicious circumstance. Professor Gamurrini's advices are, therefore, very important. According to his information, the original Romanesque church had been timber-roofed. It was vaulted and domed in the time of Vasari (sixteenth century) and changes were then made in the level of the pavement, as related to the raised choir. (See Fig. 10.) It farther appeared that all recent repairs had been made to the end of removing the Renaissance additions and vaultings, and restoring the ancient appearance and condition, and that the architect who carried out these repairs had recognized the remarkable leans of the piers and walls as facts of construction. Professor Gamurrini was not acquainted with any other similar or related phenomena, and was unable to offer any suggestions as to possible motives in such construction. The views of the restoring architect, as repeated by him, would thus appear to



FIG. 19. CHOIR GALLERY OF S. MARIA DELLA PIEVE, AREZZO.
Showing a bent column.

have been wholly based on the constructive facts, without reference to theories or hobbies or other mediaeval eccentricities.

At a later date of the survey Mr. McKecknie went with me to Arezzo, and his own verdict on the constructive facts coincided with that just recorded. It should be added that all the masonry of the piers is old, above the lower courses mentioned, up to and including the capitals.

It need hardly be mentioned that the phenomenal leans at Arezzo are much more easily noticed in photographs than in the building, because in the actual dimensions the lines tend to converge in natural perspective and the piers, therefore, appear to be perpendicular unless close attention be given them. The facts are, however, more

noticeable at Arezzo than elsewhere, and they are, generally speaking, wholly inconspicuous. That the three feet spread in S. Mark's is universally overlooked need scarcely be repeated.

The survey possesses about a dozen pictures of the Arezzo piers, from various points of view, as well as the remarkable plan published in the article containing my first announcements of points to be proven. This plan is repeated here (Fig. 18). It belongs properly to the article on Constructive Asymmetry (Vol. VI., No. 3), and is there referred to. The eccentric column on the exterior upper gallery of the choir is also repeated here from the first article of this series (see Fig. 19). I shall connect this column with some other capricious and eccentric phases of mediaeval art in a following article. Meantime, it seems to show, when united with the ground-plan and the leaning piers of S. Maria della Pieve, that there are more things in heaven and earth than are dreamed of in the philosophy of some Horatios.

VII.

"Finding the maine building to recede outwards, it was the opinion of Mr. Chichley and Mr. Prat that it had been so built *ab origine* for an effect of perspective, in regard of the height; but I was, with Dr. Wren, quite of another judgment, and so we entered it."

Wm. H. Goodyear.

(*To be continued.*)

ARCHITECTURE MADE EASY

NOTICE.

It is not our practice to admit commercial reading into these pages of the magazine, but, in the case of the circular that follows, we have deviated from our fixed policy because of the substantial benefits the "Classical Design and Detail Co." offers to the architectural profession and to the cause of classical art. We are sure nobody will deny that the present conditions of practice demand the formation of a concern like the one just incorporated, which certainly fills most satisfactorily "a long-felt want."—Editor ARCHITECTURAL RECORD.

PROSPECTUS

OF THE

CLASSIC DESIGN AND DETAIL CO.

(INCORPORATED),

CAPITAL, - - - $1,000,000.

YOU GET THE JOB, WE DO THE REST.

To the Architectural Profession:

It is well known that the chief drawback to the successful practice of architecture in the United States is the enormous burden imposed upon the architect by his office expenses. This is so great that the common computation is that an architect does not receive the benefit of more than half of his commission, even in those cases in which he does not find it necessary, in order to secure employment, to make some abatement from the nominal professional rates. Even our most successful architects find that their personal incomes bear a ludicrously small relation to the amount of business they do, and to the amount of money that passes through their hands. Those whose business, though less in extent, should suffice to maintain them handsomely, if they received their fair proportion of their earnings, have difficulty in making a decent living.

The explanation of this is simple. "Office expenses," when analyzed, are found to consist mainly of the expenses of the draughting room. It is on account of these that an architect finds himself reduced from the position of an independent business man to that of a mere disbursing agent, who, in fact, takes only a commission upon what is nominally his commission.

This condition of affairs is entirely unnecessary, in the actual condition of architecture in this country. If it were customary for an architect to design the detail of his own work, and to have the drawings for it carried out under his own direction, then, undoubtedly, the expenses of his draughting-room would legitimately absorb a great part of his commission. But notoriously this is not only not customary; it is not even permissible. Thanks to the beneficent influence of "The White City" at Chicago, and to the increasing number of graduates of the Beaux Arts embarking in the profession, the

classic revival in this country is now securely established. Not only is it no longer necessary for an architect to design anything. Every practical architect knows that if he ventured to deviate from the accepted forms of classic and Renaissance architecture, he would thereby injure his chances in a competition, or, in work for which he might be selected without competition, would impair his professional standing. There is still, no doubt, employment for designers, properly so-called, in the "allied arts" of decoration. But in the detail of architectural work there is no longer any room for designers. The plan of a building once made, and the style designated, the function of the architect is simply to select from among what may be called the canonical examples of that style, those which are most suitable for his purpose, and to have these adjusted to the proper scale and copied in detail by his draughtsmen.

This being the case, it is perfectly evident that the work of an architect's office is now done in the most wasteful way, and could be economized with the greatest advantage. In very large offices, where the extent of the business warrants the employment of a superintendent of the draughting-room, the waste may be less than in smaller offices. But even in these few cases, business is evidently conducted less economically than it could be if the draughting were committed to one great, centralized and highly organized establishment, such as we have now established. In smaller offices, the work of superintendence of the draughtsmen must be done by the architect himself, and here the waste and loss are manifest. The business of an architect, it is more and more clearly coming to be recognized, is not to design buildings, but to get buildings to design. The power of doing this successfully largely depends upon having nothing else to do. It is impossible for a man to give to it the time which in these days of keen competition it imperatively requires, if his attention is distracted by the necessity of personally conducting the design and detail of buildings, when it is also distracted by the necessity of making contracts with builders and material men and enforcing the execution of these contracts.

No doubt the present prevalence of classic architecture is largely due to these considerations. In old days, when old fogies were contented to have one important job on their hands at a time, it was possible for them to spend their time in pottering over drawing-boards

and actually designing the work that went out of their office. But under those conditions a moderate income was all that an architect could expect, and the profits of architects could not suffice to raise them to that high position in the business and social world which successful architects enjoy to-day.

It is in view of these facts that the Classic Design and Detail Company has been formed. The intention of its founders has been to establish a common draughting-room for architects, which, by reason of its scale, the completeness of its organization and the singleness of its purpose, can be conducted far more economically than any private establishment.

It is not our intention to interfere to the slightest degree with the artistic originality of our customers. When desired, we undertake from a verbal description to produce a design in plan, elevation and section, ready for estimates. But our main purpose is to do precisely what is done in the offices of architects, at from one-third to one-half the expense to them of the present obsolete method. From a small-scale pencil sketch of plan and elevation we work out a complete set of drawings. Here, again, we do not trespass in the slightest degree upon the architect's artistic function. Our professional library and collection of photographs stands absolutely unrivalled in this country. We are able to supply drawings to any scale desired of authorized detail of any school or period of Grecian, Roman, Renaissance, or Modern architecture. Reproductions of entire buildings reduced, enlarged or modified as desired. In pure classic a mere verbal indication on the sketches, such as "Order of the Parthenon," "of the Erechtheum," "of the temple of Jupiter Stator," etc., will suffice to effect the desired result. In Renaissance work, we purpose to facilitate the studies of the architect by keeping on hand and issuing to our customers sheets of all details, arranged by countries and periods; with each detail, plainly marked ("A.1," "A.2," etc.), from which the architect may without loss of time select the forms which best carry out his artistic conception, and these will thereupon be transferred to his design accurately reproduced and properly adjusted in scale, with neatness and despatch. Nor are we unmindful of the necessity of keeping abreast of the progress in architecture. Our agent in Paris will forward monthly photographs and measured drawings of buildings and details which may

fairly be considered as established, and added to the architectural repertory. We have also made arrangements to add to our office force each year several pupils of the Beaux Arts, so that our patrons may be absolutely sure of being "up to date," and that their work, where it does not adhere absolutely to the detail of the classic masterpieces, shall show their familiarity with "la mode Parisienne."

It will be seen that what we propose to do is precisely what is done now in the offices of our architects. The difference is that by reason of the advantages already enumerated we shall be able to do the draughting work of architects far more cheaply than they can do it for themselves and not less effectively. The slight sketches which are all with which a busy architect has time to concern himself personally, can be done with the assistance of a single draughtsman. We guarantee to our patrons a saving in this respect of not less than 25 per cent., and we believe that in most cases 50 per cent. would not be an excessive estimate. We also call the attention of the profession to the additional saving of office rent which they will effect by accepting our service. These two items are the largest in the architect's expense account. There will also be a notable economy in the professional library of books and photographs, the cost of which is now, in many instances, a very serious tax. This outlay can be entirely saved. We cannot, of course, make a regular schedule of rates for our services, in view of the wide differences in richness of detail and extent of ornament in different buildings. We shall, however, be happy to return prompt estimates upon the carrying out of architect's designs, requiring only the sketch plans and a memorandum of the style, as above indicated, as a basis. But we are confident that if the current computation to which we have referred is correct, that half the amount of an architect's commission goes out in expenses; this proportion will be raised, on the average, to three-quarters by the adoption of our plans. We offer a saving in time, as well as in money, and release our patrons from the drudgery of the drawing-board to the vitally necessary part of their professional work—the securing of professional opportunities. And all this not only without detriment, but, by reason of our unequalled professional library, and of our special arrangements in Paris, with positive benefit to the correctness, fashionableness, acceptability and architectural merit of their work. Very respectfully,

THE CLASSIC DESIGN AND DETAIL CO. (Incorporated.)

ARCHITECTURAL ABERRATIONS.—No. 16.

585-87 Broadway, New York.

CHESTNUT STREET, Philadelphia, used to be known as the scene of the most outrageous commercial architecture in the United States. Indeed, it was and is extremely bad, and it is rendered the more irritating by the fact that the worst buildings seem to be the most admired. The promiscuous Philadelphian will point you with pride to the municipal disgraces.

The bad eminence of Chestnut street is at present, however, loudly challenged by what used to be the pride of New York. Not that Chestnut street is any less outrageous than it used to be, but Broadway more. The good things that have been done in Philadelphia within the past fifteen years. and there have been many of them, have been erected in outlying quarters, far from the ignoble strife of the madding crowd of edifices that loudly swear at each other along and across the chief commercial thoroughfare. This is not to be regretted. One good building, a dozen good buildings, would be overwhelmed and submerged in the confusion of bad architecture. Indeed, there are buildings there which, if not very good, show some sense of the value of peace and quietness, but they are lost and do not disturb the general impression of a museum of architectural freaks.

But middle Broadway, Broadway from Canal to 10th, has become quite as awful a spectacle to the sensitive eye as Chestnut street can present. It is a full generation since it was really the pride of New York. Then it made the effect really of a broad way, being lined with buildings of a maximum altitude of five stories, and showing on each side a nearly level cornice line, along a vista pleasantly stopped to the northward by what was then the dominating spire of Grace Church. The buildings were not often worth looking at in detail. They were conventional and dull in design, but not clamorous, and vulgar only so far as they were vulgarized by the signs. The marble front to the left of the structure we have chosen for illustration, is a fair sample of old Broadway, which, forty years ago, singular to reflect, was the fashionable promenade of New York. Architecturally, it is evident from this specimen, the street was neither here nor there. The worst fault of the buildings was that, from the commercial exigencies of show-windows, most of them seemed to stand on

basements of plate-glass. Not to have any visible means of support is a very serious privation for a building. Nevertheless, and, although the walls were thin, and the detail commonplace, decency was maintained. The uniform sky-line enforced the perspective, and the occasional expanses of brownstone, as in the St. Nicholas and the Metropolitan hotels, or of red brick as in the utterly featureless New York hotel, was effective in the prevalence of a veneer of white marble, or even of cast-iron painted to that effect.

In its prime, beyond decency the architecture of Broadway did not aspire, but in the later days of its glory, there were some efforts to secure animation and individuality without loss of decency. One of them is shown on the extreme left of our illustration. Another, more successful, still stands at the north corner of Bond street. But decency and gentle dulness continued to characterize Broadway until, some twenty years ago, the elevated roads and the new channels of traffic and the up-town movement deposed it from its place as the chief thoroughfare of New York, and converted it from a shopping street to a jobbers' quarter.

The architectural results have been very awful, but it is only since the cable brought Broadway once more conspicuously into the public eye, or the public eye into Broadway, that there has been any general apprehension how awful they are. There is such an apprehension now. At least, and this is the one redeeming point, at least New Yorkers are not proud of it, as it is a tradition for Philadelphians to be proud of Chestnut street. Chestnut street is in another way the more discouraging thoroughfare to the thoughtful patriot, because there is no denying that the development of it has been autochthonously American. Broadway, on the other hand, is an architectural Babel, a confusion of tongues. The present development of it corresponds to the latest phase of immigration, as attested by the names on the signs which still farther variegate and vulgarize its architecture, and bespeak not only an Anglo-Saxon and a Celtic and a Teutonic but a Semitic and a Slavonic population.

Indeed, it is the heterogeneousness of the part of Broadway of which we are speaking that makes this mile from Canal street to 10th perhaps the most horrible stretch of architecture on the face of the earth. Everything has conspired to make it so, but most of all the facility which the steel frame has afforded of carrying buildings twice as high as it used to be possible to carry them. It is this baleful invention that has enabled the later builders to destroy any possibility of unity of effect which had been left by the variety of materials and the miscellany of styles. The majority of the building is still, perhaps, of the pre-elevator era. But at all manner of irregular intervals there came to interrupt it the gaunt sky-scrapers, with their bald, ungainly flanks and their architecturesque ungainly fronts, of which it is



NOS. 585 AND 587 BROADWAY, NEW YORK CITY.

BOSTON PUBLIC LIBRARY

difficult to say which aspect is the more revolting. The mere absurdities and outrages of detail, such as tying up stumpy granite columns with brass cords, and the rearing of huge pediments of sheet metal over plain fronts are trivial and harmless in the general nightmare.

It follows that it is futile as well as invidious to pick out any single building for especial animadversion. It is like relating one episode of a bad dream to explain the horror of a nightmare, when on horror's head horror accumulates, and it is in the accumulation that the horror chiefly consists. An artistic architect could do nothing to abate the awfulness of the spectacle, unless he had a whole block-front to himself, and even then one would have to limit the field of view to the block-front in order to enjoy it. In the case of a narrow front inserted in a block, it would be impossible for an architect intrusted with one of these to set an example of conformity, for there is nothing left to which to conform.

But the rebuilders of Middle Broadway have kept clear of artistic architects, and the architects to whom they have had recourse have had nothing less in view than conformity. The main notion of each has been to secure the visibility of his own work. Each one has cried aloud and spared not, and among them they have filled this mile with a shrieking dischorus.

If one must select a single aberration from a street full of aberrations, No. 585-7, does pretty well. The illustration hardly does justice to its specific demerits, which a full front view would bring into more prominence. But, on the other hand, the point of view of the illustration is very well chosen to bring out its rasping discordancy with its surroundings, and the manner in which it converts a block front of merely stupid and unnoticeable building, and, as on the extreme left, even better than that, into a spectacle to set one's teeth on edge.

It is quite true that the problem presented by a twelve-story building only fifty feet wide in a block-front of buildings of five stories, is very difficult. Quite possibly it is insoluble—that is to say, it is impossible in such conditions to produce a merely inoffensive ensemble. Certainly it is impossible to produce such an ensemble while the building remains provisional, as in this case, when the flanks of it are left unfinished, because there is no telling when the next owner may avail himself of his right to put up a building twelve stories high, or, for that matter, twenty-four. When he does that he will nullify not only whatever pains you may have taken to make the flank of your building presentable, but whatever pains you may have taken to secure light and air. If you make a distinct recess, however, in the middle of the flank you will put some pressure upon him to make a counterparting recess on his side, and through the shaft thus reserved

some light will trickle down into your interior. But no such forethought complicated the procedures of the author of 585-87 Broadway. He built to the limit, and cut in the veneer of the sides provisional openings to be closed whenever the next man takes it into his head to build a wall against them in the exercise of his right to do as he likes with his own.

In the meanwhile, this flanking veneer is a dismal object. It is evidently not a wall, for the shallow "reveals" reveal enough to show that it is too thin to stand alone, while they conceal whatever of adequate structure there may be behind it. The smooth meaningless expanse, with holes cut in it apparently quite at random and the only variation in its outline the jog in the sky-line apparently equally at random, although it amounts to a proclamation of weakness and incompetency, is entirely artless and undesigned. It is perfectly irrelevant to architecture, good or bad, although it is equally conspicuous with the architecturesque front.

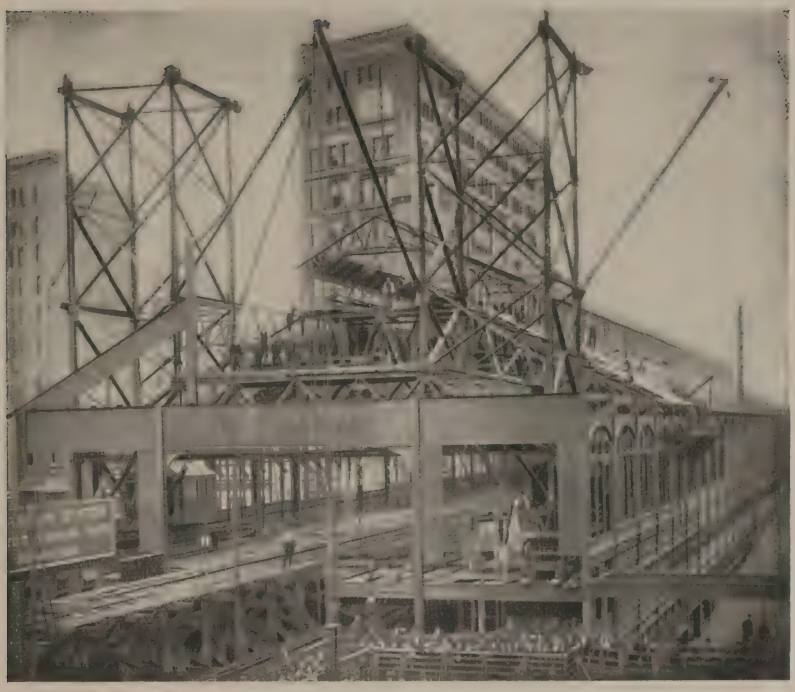
It is a dismal object, and yet not so dismal as the architecturesque front, to which it is preferable as mere vacuity is preferable to obtrusive vulgarity. The architectural front is quite as devoid of ideas as the flank, which does not pretend to have any, while the false pretence that it has them makes it more irritating. It is noticeable for the completeness with which everything that has been learned about the design of high buildings is ignored by the author. There is no leading motive, there is no subordinate motive, there is no relation of one part to the other. Any story or group of stories might be interchanged with any other without injury. To attain "variety" is the only purpose that can plausibly be imputed to the designer, and in the pursuit of it he has attained a jumble.

It is really curious how a structure which does at least stand up can be made to appear so dislocated and precarious. The openings are aligned over each other. Every few stories there are horizontal lines belting the front, and yet the total result is mere higgledy-piggledy. There is no beginning, no middle, no end. The two stories, the fifth and sixth, in which the architect has abstained from architecture constitute the only part of the front which is as inoffensive as the side, in which he has abstained altogether. If he had abstained further, and left the two stories below these and the three above as plain as themselves, a relation would have been established between the parts of his building, and the base and the crown might have been developed so as to form a front, which would have been agreeable to look at by itself. But here the fate of the unreasoning architect befell him. He could not let anything alone. There is in the actual structure, the aborted germ of an architectural arrangement. The five stories, from the fourth to the eighth, inclusive, would have formed a middle, and the inclusion of another plain story

by raising the arcade to the ninth would have put this in fair proportion to the top and bottom, if he had only let it alone. But he really couldn't, poor man. He was compelled to "finish" the arches of his third story with level architraves. He was compelled to variegate the level openings of the seventh story with keystones. Finally, lest some unity might still be perceptible in his miscellany, he had to interpose a projecting string-course between the sixth and seventh stories When he had done this he had so effectually obscured what there was of a motive that it is only by searching that it can be detected. The arrangement of stories which would have appeared if he had let it alone was 3, 6, 3, which is not a bad proportion. The apparent arrangement after he has done is 1, 2, 3, 2, 1, 2, 1, which is no proportion at all.

Still, his "undistributed middle" is the least offensive part of the front. The most offensive is doubtless the basement. The lanky order which occupies and includes the second and third stories is a terrible object in itself, and it is rendered yet more terrible by the manner of its superposition upon the first, and the signalization of one bay of this by the free standing columns. The top escapes equal offensiveness partly by its remoteness, so that one is not obliged to look at it. But when one does look at it nothing could well be uglier in itself than the two-story order cut by the protruding pediments of the lower story, and enclosed, above and below, by single separate stories, while nothing could be more completely irrelevant to the rest of a front which is an aggregation of irrelevancies.

Perhaps this is not the worst thing in middle Broadway, although nothing could be worse. Indeed, the most discouraging thing about it is that there should be a street in which such a thing should not be very noticeable. But there is nothing more exemplary in the helot way, nothing which vulgarizes its surroundings more thoroughly. There is nothing which more completely exemplifies how unneighborly and uncivil the sky-scraper may be, how "ferae naturae," and how necessary it is that it should be brought within the reign of law. No document could be better adopted than this photograph to prove to the legislator that something must be done. Such a sky-scraper not only violates the Roman maxim that a man must so use his own as not to injure another's, but it also shows how one greedy owner may authorize an incompetent architect to vulgarize a quarter and nullify the efforts of those who are trying to make a seemly and handsome city. Such a building cries aloud for some representative of the public, some prefect, aedile or what not, who shall be empowered to prevent the erection of more such. And that is why it is worth while to sully the pages of an architectural periodical with a view of 585-7 Broadway.



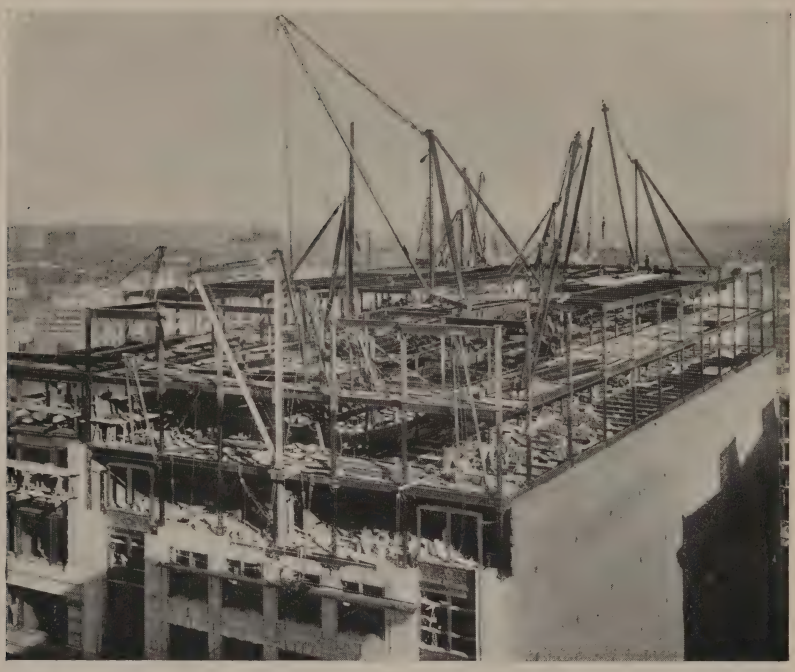
NEW YORK TERMINAL OF THE BROOKLYN BRIDGE.

SKELETON CONSTRUCTION.

THE system known as Skeleton Construction is without doubt the greatest innovation that has been made in the science of building in recent times, for without it the modern high building or "sky-scraper," which has already begun to revolutionize the appearance of American cities, would be impossible.

But skeleton construction is far from having reached its fully developed form. The few years that have elapsed since its incorporation in any buildings of note have witnessed changes, improvements and developments that are indicative of what may be expected in the future.

The continually increasing height of the modern building has developed methods of foundation construction that were unknown a few years ago, and the use to which steel has been put in these foundations, and its adaptibility in connection with concrete for such foundations are among the wonderful discoveries of the past decade. Thus



BIRD'S-EYE VIEW NEW TWELVE-STORY BUILDINGS, 594-596 BROADWAY, SHOWING ERECTING PLANT.

the steel skeleton becomes the progenitor of the "steel grillage foundation" in its multiplicity of variety, the metal no sooner gaining a firm hold in one department of construction than it enters another important field in competition with other other materials and in its latest application shows its superiority.

Thus it is that to-day the "iron work" is by far the most important part of the modern building, and demands for successful or even adequate treatment the expert of unusual capacity and abundant experience. Architects will testify that there are few such. Indeed, in the designing of his building, the architect finds that the iron work presents to him his most difficult problem. His observation shows him that most of the expensive delays that have occurred of late in the construction of large buildings have been due to some difficulty, error, or mishap with the iron work.

As a consequence it is natural that the important contracts for this part of a building are passing into the hands of a few firms that have made special preparations for executing them, and who, with their experience, their well-developed organization of men accustomed to each part, and their extensive plant for the erection of the frame, are

peculiarly fitted for such work. As an example of this tendency, the readers of this magazine will see that the iron work of the following structures illustrated or described in this issue: The Fahys Building, 29 and 31 Liberty street and 54 Maiden lane; the Woodbridge Building; the Graham Building, Duane and Church streets, and the Rhinelander Power House, 232-238 William street, was done by the firm of Levering & Garrigues. That one house should be entrusted with the iron work of so many, almost contemporaneous buildings, is significant of the capacity, experience and influence which it possesses. The recent work of the firm includes not only the buildings above mentioned connected with the name of Clinton & Russell, but numbers of equally large edifices for other leading architects.

The members of this firm are justly proud of their record for erecting the class of work described with promptness, coupled with a freedom from accidents that it is thought is not surpassed, if equalled, by any other firm in the same line of business. As general contractors for the New York terminal of the N. Y. & B. Bridge, they recently removed the old station and simultaneously erected the new building while an average of 150,000 persons were each day passing through and under their work without serious accidents to a single traveler.

Levering & Garrigues are not only iron contractors; they are also trained engineers, and with their large, well-equipped staff of employees it has been possible for them to render services to architects beyond the capacity of other firms. They have contributed to the development of skeleton construction, and possess the scientific knowledge which is to-day absolutely necessary, if iron construction is to be economical as well as sound.

This firm was the first in New York City to erect the skeleton framework of modern buildings by means of boom derricks, now so common on all large buildings, and in consequence of which it has been possible to reduce the time of erecting such frames by at least one-half. A great deal of thought and ingenuity has been expended in making these derricks proof against accidents. The masts are made of heavy steel piping, secured to the sills through steel forgings, into which they are screwed and riveted, thus being able to resist tension, as well as compression. Similar care has been exercised to avoid accidents in all other appliances.

But this novel and highly organized iron structure, with its superimposed architectural finish of brick, stone and terra cotta is not yet a completed building, and much is needed in the way of ornamental iron work to make it so, and here, again, those firms, such as Levering & Garrigues, who have their own shops for the manufacture of this finishing work also, are at a great advantage. The concentration of all the iron work, structural and ornamental, into the hands of one intelligent, experienced firm, having their own shops for the fitting



THE WOODBRIDGE BUILDING IN PROCESS OF CONSTRUCTION.

and finishing of the work, is a condition on which all prudent architects now insist; and having attained which, they can feel secure regarding the execution of the most important contract connected with the modern building.



THE WOODBRIDGE BUILDING,

William, John and Platt Streets, New York. Clinton & Russell, Architects.

CLINTON PUBLIC LIBRARY

AN IDEAL ELECTRICAL EQUIPMENT.

PERHAPS in no other building on Broadway has the electrical lighting received more attention than that given the Hudson Building, and no little praise must be given to the Brooklyn Electric Equipment Company, the electrical contractors, for the readiness and ability with which they carried out the ideas of Messrs. Clinton & Russell. The abundance of light, which the tenants will doubtless appreciate, is furnished by a direct connected plant, located in the sub-basement, consisting of two 75 k.-w. and one 50 k.-w. generators. The switchboard is located conveniently near, and consists of highly polished white Italian marble slabs, mounted on a substantial iron frame. The space behind the switchboard is surrounded by a grille work, having a suitable door for entrance. On the switchboard are mounted in a symmetrical, yet convenient, arrangement all the instruments and switches necessary for the control of the 2,000 odd lights in the building.

In choosing the method of distributing the current, the unusual depth of the building was particularly kept in mind, and each floor was divided into two distributing centres, one for each half, supplied by their respective feeders direct from the switchboard, the hall, corridors and toilet lights being supplied by an independent feeder. At each distributing centre is placed a marbleized slate panel on which is mounted a knife-switch for each circuit radiating therefrom. These panels are surrounded by a marbleized slate box, around which, with a three-inch air space intervening, is a hardwood box. All wires are of the very best rubber-covered, moisture-proof insulation, and are run in insulated heavy iron-armored conduits. These conduits were installed as the building was erected, and from the improved method of fastening them they are really a part of the building itself. At each outlet is placed a Mezger "Universal" cast iron outlet box, into which the conduits terminate and are rigidly fastened. In the installations of Lord's Court Building and the Central National Bank Building, the Brooklyn Electric Equipment Company has given other evidence of its skill and ability to grapple with electrical engineering problems. In these buildings the then experimental, but now highly approved "vertical system" was installed. In Lord's Court Building, where there are more than 4,000 lights, they demonstrated the practicability and efficiency of supplying all these lights from vertical circuits originating at distributing points in the basement. The vertical system originated and has been much advocated by Reginald Pelham Bolton, C. E., but it was

the good fortune of the Brooklyn Electric Equipment Company to demonstrate the merits of the system, as may be seen in either of the last two named buildings. Of course the vertical system cannot be used where the tenants are required to pay for their own current, but with the "drainage system" as introduced by this company it is different. Another example of their excellent work can be found in the Brooklyn Institute of Arts and Sciences, Messrs. McKim, Mead & White, architects; the New York Wool Exchange, corner of West Broadway and Beach Street, New York. The Academy of Music, Brooklyn, is a striking example of how much can be done with a limited sum, if placed in the hands of a practical engineer. This theatre possesses an electrical equipment second to none in the country, and which probably cost not more than half of its equals, and it is probable there is nothing in the business career of the Brooklyn Electric Equipment Company that gives them more pride than the following letter from the chairman of the building committee:

Brooklyn Jany 16th 1895.

The Brooklyn Elec. Equipmt. Co

Dear Sirs

I am directed, by the Committee in charge of the Electric lighting of the Academy, to say that after the examination of the wiring and Extra work done by you without orders, they have decided that the things charged for were not called for in the Contract and are greatly to the benefit of the Academy, making the lighting perfectly satisfactory. In view of this, I have the pleasure to report, they have voted you the Sum of five hundred and fifty dollars

Yours truly

John J. Pierrepont

Ch. of Committee

The system of stage lighting employed was entirely original, and the switchboard, which was especially designed for the purpose, is very simple for the control of nearly 3,000 lights, only one person being required to operate it, and is but an example of the ingenuity displayed by the company in dealing with some of the difficult problems in electric engineering.

PROPER PROTECTION FOR ARCHITECTS.

THAT it is "stuck together" is not the first impression that occurs to one in regarding a piece of masonry. Somehow or another, in the ordinary notion of what goes to the makeup of a building, one of the most important elements is ignored. The iron and the brick and the stone and the timber all figure prominently enough, but cement is almost forgotten.

It is a curious fact that this slurring of one of the most important constructive materials in the common understanding of the makeup of the building finds in some degree a counterpart in the lack of scrupulous attention to cement which marks some architects' specifications. We don't mean to say that the architect is in the least degree unaware of the important part which cement plays in his buildings, but it is fairly open to question whether he gives attention to that material proportionate to the extreme care with which he considers his iron work, the stone he employs, or the particular make of dynamo that he installs for electric service.

We have seen, for instance, specifications wherein the cement called for is designated simply as "Rosendale." Good! But what brand of Rosendale? There is good and bad to be dealt with in Rosendale, as in all other materials, and a looseness in this matter must be taken as indicating, in a way, a certain indifference regarding an important item of construction.

Another fact pointing in the same direction is this: The architect keeps himself thoroughly posted regarding what is going on in the manufacture of iron, elevators, electrical apparatus. He knows all about novelties in decorative marbles, or mosaics, or hardware, or plumbing, but when it comes to the progress that has been made, and to the changes that have occurred during the last few years in so important an article as cement, he is, if not ignorant, at any rate, less well informed.

There has been no natural reason why the immense building market of this country should draw on a foreign supply. The proper materials we have always had in abundance.

The American product ranks with the best made abroad. The commercial reports tell the story. American cement has been dislodging the English and German article. It does every bit as good work, yet we fear American architects are not fully aware of the saving they may effect for their clients by using the American product. Engineers are much wider awake to the facts.

Great improvement has been made in what are technically known as Rosendale cements. The word Rosendale covers a number of brands of different manufactures, some of which are not as good as

others, but the best of the Rosendale brands are as good as anything in the market, and the use of them is a big economy in a building.

The best of these cements is that known as "The Brooklyn Bridge Brand," and when the architect is making his specifications, he should be specific in naming this make of cement. It is absolutely hydraulic, dark, finely ground, uniform, reliable, and will permit the use of the largest proportion of sand. It will stand high tests and give better satisfaction than any other brand. It is especially adapted for use under water or out of water where tensile and compression tests are required. It is carefully made from selected stone. The fineness, on a sieve of 2,500 meshes to the square inch, is 95 per cent.

It is manufactured only by the New York and Rosendale Cement Co., the New York office of which is at No. 280 Broadway.

The quality of this cement, its uniformity and economy, is established beyond dispute, because it has been so extensively used, not only by the United States Government, but by engineers and by many leading architects and builders. It was used, for instance, in the New York and Brooklyn Bridge, in the Great Washington Bridge over the Harlem River, in the Monongahela Bridge at Pittsburg, Pa., in the Williamsbridge reservoir, in the Brooklyn Post Office, in the Gas Works at Stamford, Conn., in the Fidelity and Casualty Co.'s Building, in the great Astoria Hotel, the largest hotel in this country, and in the tallest office building in the world, now in the course of construction on Park row.

One hundred thousand barrels of this cement were supplied for the New York Croton Aqueduct, and as a supreme test of its hydraulic qualities, mention should be made of the fact that it was used by the Central Gas Light Co., in their gas-tank foundations, at the foot of 138th street at Port Morris. The foundations of this work are forty feet under ground, and at high tide thirty-five feet of water surrounds them. In this position the cement has proved to be of a notable excellence. The Equitable Gas Light Co. have also used the cement for their foundations at the foot of 41st street and East River.

These are only a few instances of where the cement has been used and by whom it has been used. Pages of names and locations could be given, and in all cases the cement has been satisfactory. A great many architects have used it. Firms like McKim, Mead & White, R. H. Robertson, Cyrus L. W. Eidlitz, Clinton & Russell, R. W. Gibson, Cady, Berg & See, H. J. Hardenbergh, W. H. Hume, Ernest Flagg. Stronger facts for its excellence cannot be adduced, and it has been found that it is especially adapted for heavy masonry and for sewers and concrete work. But to be sure of getting this brand and the guarantee of excellent work which accompanies the use of it, architects must specify "The Brooklyn Bridge Brand."

SUCCESSFUL BUILDING.

IN looking through the review and illustrations of the work done by Clinton & Russell, published in this magazine, many practical persons are likely to find themselves interested in other matters than the artistic side of the buildings discussed. There are a great many questions, we are sure, which many would like to ask about the constructive problems, and the economic problems involved in these buildings. What was the nature of these? How were they overcome? Who did the work?

It is, perhaps, impossible to touch upon all these points in a magazine article, but we venture to believe that they are none the less interesting or worthy of treatment. Indeed, we will venture to assert that to-day the artistic problem in a big modern building, is, we won't say less interesting than others, but at any rate it is of less practical consequence and receives, upon the whole, less attention. The making of a design has become only a very small part of the architect's work. For the owner it is the least important part. The paramount questions now are questions of finance, questions of equipment and questions of workmanship and superintendence. It is in these that the architect and owner have to be most concerned in order to insure a successful building.

Yet, strangely, these matters are very rarely discussed in any architectural publication. We might say they seem to be avoided. Is this because they savor of "business?" If this is the reason it is a poor one. Business is every bit as legitimate as art. It is as legitimate a topic for discussion, and we venture to assert, for a majority of the human race, it is very much more interesting.

Indeed, how intensely interesting the "business" part of building becomes is known only to those who engage in building operations. Some time ago we asked an owner who was putting up a building what interested him the most, and he answered promptly: "Trade Literature." He went on to explain that this was because it touched upon the question of who could do the work he needed done and what the market offered for construction and equipment.

These are the main questions also for the architect. We are sure, therefore, that an article of immense interest could be written, setting forth the details of construction in the work of Clinton & Russell, speaking as well of the firms to whom the work of construction was intrusted.

If this were done, one of the first matters that would have to be touched upon would be, who did the actual work of constructing the buildings. One firm, of course, has not done it all, but it happens that one firm has done the greater part of it. Take the Woodbridge Building, for instance, the Laight street stores, the Rhinelander Building, at Duane and William streets; the Rogers Estate stores, 47 and 49 West 13th street; the Sheldon Building, on Nassau

street; the Stuyvesant warehouses, on East 13th street; the Stokes Building, in Cedar street. These were all intrusted to the well-known firm of mason builders, McCabe Brothers, whose offices are at Nos. 33 and 35 West 64th street.

Obviously, the builders who did this work are of the highest rank. For the construction of these large modern buildings needs great resources of capital and experience, and the architect can take no chances in those whom he trusts. He must select with care—and the continued employment of the same firm is the strongest kind of recommendation of the complete satisfactoriness of their work. They started in business nearly thirty years ago, and for the last twelve years they have stood in the first rank. The firm has made a specialty of high class work and have devoted their attention to modern office buildings, expensive residences, large churches, halls and club-houses. Many of the largest buildings in the city, designed by the leading architects, stand to their credit.

We have already spoken of some of the work they have done for Clinton & Russell, but outside of that office they have been equally successful in obtaining contracts. For R. H. Robertson they built the Van Ingen Building, Nos. 5 and 7 West 29th street; the Mohawk Building, 5th avenue and 21st street; the McIntyre Building, 874 Broadway; the Holland Building, Broadway and 40th street; Academy of Medicine, West 43d street; the New York Clubhouse, 5th avenue and 35th street; the Mendelssohn Glee Clubhouse, 6th avenue and 40th street; St. Paul's M. E. Church, West End avenue and 86th street; Chas. T. Yerke's residence, 5th avenue and 68th street; the Van Ingen residence on East 71st street; the Stokes residence, 37th street and Madison avenue, and the Blair residence on East 61st street. For McKim, Mead & White, McCabe Brothers built the famous Century Clubhouse; for Barney & Chapman they erected Grace Church buildings, on East 13th and 14th streets, as well as the Revillion Building, 13 and 15 West 28th street; for DeLemos & Cordes they built the Boskowitz Building; for Jardine, Kent & Jardine, the Bonfils Building, 5th avenue and 21st street; for Parish & Schroeder, the Y. M. C. A. Building, 56th and 57th streets, near 8th avenue; for George Harney, Clinton Hall, Astor place and 8th street; for E. H. Kendall, the Methodist Book Concern Building on 5th avenue; for Harney & Purdy, the Lincoln warehouses; for William Schickel, Ehrich stores, on 6th avenue, and for C. C. Haight, the professor's houses in the General Theological Seminary, and for the same architect, the Five Points Mission Building.

In going over this list of buildings, the reader will observe that the architects named are the best known in the city, and the buildings some of the largest and most important that have been erected. All this work has been done in the last twelve years, and few building firms, if any, have a superior record. It is one to be proud of.

MODERN BUILDING.

IT is a curious fact in connection with the building trade that, although the number of builders has experienced an increase during the last few years, the percentage of those occupying places in the front rank has grown gradually smaller. The reason for this is that the standard for high-grade building has advanced to such a place that comparatively few of those who were formerly considered first-class builders have been able to successfully fulfill the new conditions.

This new standard has been set by the builders themselves, or, rather, by a small portion of them, who, realizing that the recent revolutionary changes in building demanded a corresponding advance by those who were to accomplish successful and satisfactory work under the new conditions, undertook to meet the new requirements. Not but what there has been a general advance all along the line, for the building trade is by no means stationary, but it is a natural law that when a certain number of people start on terms of equality, the equation will ultimately be destroyed. This is what has happened in the present instance, and the result is that we find a little group of builders isolated, to some extent, from their fellows.

Among the New York firms who may be mentioned as being in this smaller division is that of S. McMillan & Co. This firm was founded some six years ago by Samuel McMillan, James W. Pacey and William Young. Each of the partners having been in a separate branch of the building trade, the union of the three made an exceedingly strong combination. This specialization along certain lines has been of considerable advantage to them and their clients. It can be readily seen that a firm which is able to make such a division of expert knowledge possesses an unusual opportunity for doing the finest work.

Their work may be seen at Long Branch, Llewellyn Park and Orange, New Jersey; Tarrytown and Port Chester, New York; Jamaica and Brooklyn, Long Island—in fact, at many of the well-known suburban towns and watering places. Although they have also erected many dwellings in this city, they have by no means been confined to this class of work. Among the office buildings which they have put up are the Chase Building, at 481 5th avenue and the entire remodelling of the Brandreth House, Broadway and Canal street, for the Brandreth Estate, the work being quickly done without any disturbance to the tenants. They have built for the best archi-

tects in New York, including such firms as Clinton & Russell, McKim, Mead & White, Cady, Berg & See, John H. Duncan, Jardine, Kent & Jardine, William J. Fryer and Cleverdon & Putzel. For the last-named firm they have erected the buildings 657-659 Broadway, 7 Lafayette place and 3 and 5 West 18th street.

They are at present engaged in the construction of a model tenement for Miss Mary Van Allen, of Newport, R. I. The work is being done under the supervision of Messrs. Clinton & Russell. They are also doing the two Goodwin houses, in West 54th street, for McKim, Mead & White. Mr. McMillan, the senior member of the firm, is president of the Board of Park Commissioners for the city of New York. He is also vice-president of the Mutual Bank, and a member of the Real Estate Exchange.

The foregoing partial list of the buildings already erected by S. McMillan & Co., and those in process of construction, shows the resources of the firm. The scope of their work, embracing, as it does, private dwellings, office-buildings, and many used for other purposes, is an indication of their complete mastery of the science of building.

On inspecting a factory we can, almost at a glance, form some idea of the size of the entire plant. Not only can we see the finished product of the huge and complicated mass of machinery, but we can follow it, almost from its inception, through its various stages of manufacture. This gives us a realizing sense of the size of the firm, of the capital necessary to carry on such a work and of their facilities for doing business which we could never have gotten by simply looking at a sample of their production. In the building trade, on the contrary, we consider, as a general thing, the results. The vast plant is there, as in the factory, but it is intangible and invisible. In the construction of a large building, the stonemasons, bricklayers, carpenters, roofers, and others, each have their separate allotted time for work, so that we really see but one stage of the building. Consequently, we do not realize the skill of organization and nicety of calculation which is necessary to put in their proper places the huge masses of stone and the heavy iron girders. This is done, too, with but comparatively little interruption of street traffic.

To carry on work like that done by S. McMillan & Co. means much more than the mere procuring of the contract. It requires experience, skill, executive ability and, something which is absolutely necessary, sufficient capital. That S. McMillan & Co. meet these requirements is indisputably shown by both the quantity and quality of the work done by them during their six years of business existence.

Their offices are at 327 West 42d street, New York City.

THE "PERSONAL FACTOR" IN BUILDING.

IF any one had told an architect of twenty years ago that within a few years he could run a building up to a height of twenty stories, or superimpose such a structure upon a first story of no greater thickness of wall than the twentieth, he would have been laughed at for his pains.

It is the advent of the use of iron that has worked this great change. A huge skeleton of iron is the basis of the modern building, while the walls have ceased to be the supporting element and have become merely an envelope.

The increasing complexity of these latter day structures and the corresponding need for greater responsibility on the part of the builder has given rise to a new conditon of things in the building world. For the more important kinds of work there has been a demand for only the builders of unquestioned ability and integrity and those upon whom the architect may place the dependence which is so absolutely essential.

The importance of this need for reliability on the part of the builder can scarcely be overestimated. While it is true that the work is done directly from the architect's plans and under his personal supervision there are many points on which he must needs put trust in some one, and that man is the builder. True it may be argued that the builder must in his turn place the same dependence upon his workmen. Of this there is little doubt, yet at the same time a builder of a certain grade in time builds up a force of workmen upon whom he may rely. In the same manner, it is true, that a man who is careless or unscrupulous is a large factor in developing those qualities in the men who are in his employ.

Again, the builder should be more than a mere machine to fulfill the technical requirements of the specifications. He should be a man with some knowledge of the possibilities of his work and of sufficient ability to take advantage of them. There are many opportunities that arise during the erection of a building, which, if used properly, would cause a saving of time or labor, or, perhaps, correct an element of weakness. In the interpretation of plans the builder should be able to understand many unexpressed but at the same time important points.

An evil that is no inconsiderable one is too low bidding on contracts. By this is meant the securing of work at such a figure that absolute and honorable compliance with the architect's specifications is practically impossible. The result of this is easily seen. The builder

finishes a portion of the work and it is not in accordance with the plans. The architect objects and holds him to the original. This is continued through the entire process of construction or until it results in the inevitable shortage. As it is contract work this shortage must be borne by the builder. Consequently, there is a retrenchment on that part of the work which, either from accident or oversight, has escaped the architect's eye. This may never become known, or, again, it may be found out, but the defect may be of such a nature that to remedy it is an impossibility.

It would seem that the need for trustworthy builders and honest workmanship would be satisfied, for to apply an axiom of political economy, the demand creates a supply. This is exactly what has occurred, although it has come in this way: the builders have gradually become separated into grades. A few firms have drawn away from the others, and, by virtue of the quality of their work, enjoy the patronage of the most prominent architects. A glance at the vast amount of work Mr. Richard L. Walsh has done for the architects, Messrs. Clinton & Russell, showing as it does the confidence placed in him by one of the largest architectural firms in New York, says everything, so far as his ability and integrity as a builder is concerned. This firm of architects do business on such a large scale that a builder who is favored by them has little time for other work.

A fair specimen of Mr. Walsh's may be seen in the Woodbridge Building, which occupies the entire block front on William street, between John and Platt. Among others he has built are the Samson Building, Nos. 63 and 65 Wall street; Stokes Building, Nos. 45-49 Cedar; Stevens Building, Nos. 3 and 5 Maiden lane; Sheldon Building, Nos. 68 and 70 Nassau. On Broadway, between 8th and 9th streets, Mr. Walsh built, practically, the whole block, including the large store of John Daniel & Sons. This work was carried on without interruption of their business. Mr. Walsh has built principally for private owners, a class of work which requires the greatest care and finest workmanship. His office is in the Stokes Building, at Nos. 45-49 Cedar street.



LAMMERT RESIDENCE, MANNHEIM.

Prof. Adolf Hauser, Architect.

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The
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PALLADIO AND HIS WORK.

IN an age like ours, in which historical research is pushed to extreme limits, it is curious to find that neither the family name nor the birthplace is known of so celebrated a man and an architect at Palladio!

One of his contemporaries, Paul Gualdo, who wrote a life of him in 1749, states that Palladio was born in 1508, but this date was disputed as soon as Temanza published, in Venice in 1778, a remarkable work on the lives of her most celebrated architects and sculptors. Joseph Smith, it will be remembered, had a portrait of Palladio by Bernardino Licinio (called the Pordenone) with the following inscription: B. Licinii opus Andreas Paladio a Annorum XXIII. MDXLI. The portrait mentioned by Temanza was afterwards engraved, according to Magrini—the author of an excellent study on the life and work of Palladio, which is scarce now. Be this as it may, the portrait by Licinio, which is dated 1541, represents Palladio at 23, indicating that our architect was born in 1518 and not 1508, as stated by Gualdo.

The Abbé Zanella, who published a life of the architect, on the celebration at Vincenza of his 100th anniversary, accepted the date of the Licinian portrait; but the study is drawn up altogether on the assumptions of Magrini.

However, putting aside this detail, we find ourselves again uncertain as soon as the reader is curious to know (like Dante in hell in the presence of Farinata degli Uberti) of the ancestors of our hero. All we know about the family of Palladio is that his father's name was Peter, and it was only a few years ago that it was discovered he was a miller at Padua. Not even his surname is known. We know only from a record of Sebastien Liviera, who lived in the second half of the seventeenth century, that our artist received the name of "Palladio" from Jeangeorge Trissino (a noble litterateur and classic enthusiast) in consequence of the vivacity of his talent, in the same

way that Alexandre Maganza (a painter of renown and a friend of our architect) was called Terpandro, and all for that ardent love of the classical which existed in Italy during the fifteenth and sixteenth centuries, the numerous and singular causes of which it is unnecessary to speak of here.

Palladio, then, was born at Vicenza, that pretty city in Venetia, and we know him by a surname only, and one that is not the name of his family. His origin was humble enough, but he had the good fortune to become early acquainted with that noble Vicenzan, Jean-george Trissino, and it was from him he drew his first inspirations.

In his youth Palladio was a member of the masons and stonecutters' corporation, and it is not surprising that from this he subsequently became an architect. This is not unusual in Italy, and Brunelleschi, Antoine da Sangallo, Sansovino, before they triumphed in architecture, exercised those arts which the ancients qualified as secondary. Gualdo says that in his youth Palladio was a sculptor, but we think, in this instance, we should understand by sculpture the art, namely, of carving or cutting in stone.

Connected first with Trissino and afterwards with some of the richest families in Vicenza (such as Porto, Valmarana, Barbaro, Thiene), Palladio was early placed amidst favorable surroundings. Notwithstanding this his financial position was anything but easy, if one may judge by the advances he requested while he was architect of the Basilica at Vicenza. Perhaps his large family, four sons, Marcantoine, Orace, Leonide, Sille (note the classical names) and one daughter, Zenobie, who married, kept him down.

It is not known at what age Trissino became acquainted with the son of the miller of Padua, but it is generally understood that he first met him at his Villa Cricoli, while it was in course of construction, and on which Palladio was working as a mason. This was in 1536, which would go to show that Palladio was born in 1518, rather than in 1508, and that, therefore, Trissino met him for the first time when he was a young man of eighteen. This gives a fresh importance to the date of the Licinian portrait, because if we admit that this date should take the place of that given by Gualdo (1508), then Palladio was twenty-eight when he first met Trissino at Cricoli. It seems more probable that Trissino would encourage a young man of eighteen than one of twenty-eight. The more so as it is here a question of advising him what studies to pursue. Trissino might have met him at Cricoli on some occasion other than the construction of his villa, because the fact of meeting at Cricoli precisely on the occasion of the building of the villa is not on written record, and the statement has been shown to be untrue that it was in consequence of Palladio proposing a magnificent staircase to Trissino that the latter then and for that reason commenced to patronize the simple mason employed on his villa.

To sum up, Trissino inspired Palladio, and had it not been for his protector, Italy probably would not have had Palladio nor Palladian architecture.

Palladio himself says he was always of opinion that the Romans were in architecture, as in many other things, far above those who came after them (this was the opinion of the day). Consequently he studied their monuments, and also the work of Vitruvius, with real delight, but he confesses it was Trissino that directly stirred him to undertake his classical researches.

He made several journeys to Rome, accompanied by Trissino, in order to learn the Greek and Latin languages (perhaps under the direction of Trissino himself) and visited Ancona, Capone, Nimes to study their local Roman antiquities.

Palladio found that it was not possible for him to succeed as an architect simply. He became a writer and a student, and, as a matter of fact, he is well worth quoting, although this is so seldom done.

Palladio visited Rome three times, accompanied by Trissino, who admired Vitruvius not less than that he did Homer, and on a fourth occasion our architect was called to that city in regard to the Basilica of St. Peter. He never tired in his admiration of those latian monuments, which even in the sixteenth century were to him a new revelation.

It is remarkable that Palladio, far from studying the works of Raphael and Michael Angelo, in the Eternal City, addressed himself more particularly to the sources from which these masters drew their artistic inspirations, and this method of investigation, which one might consider as altogether modern, awoke in him a "*talent d'élite*," which as Horace says, is an enemy of all imitations. "Imitatores Servum pecus."

Let us now speak of Palladian art, and of the more important edifices erected by this Vicenzan architect, who, in the course of his artistic education, trusted to the study of monuments above all things, and who built for himself a renown wherever there are enlightened lovers of architecture.

The masterpiece of Palladio is, without doubt, his first work: the Basilica of Vicenza, built upon the most important site in the city. The oldest documents relating to this palace direct us back to 1222, and after that date building after building was destroyed by fire. Thus, Vicenzan writers inform us that it was the prey of fire in 1290, again in 1335, and in 1370, 1374, 1378, was restored and subsequently was rebuilt from top to bottom in 1444 by a vote of the citizens. In fact, we find in a paper dated July 30, 1443, and signed by the Doge François Foscari, and addressed to the Vicenzans who had demanded the pecuniary aid of the Republic in the re-construction, that he, the Doge, before granting their request would like to have a description



THE BASILICA, VICENZA.

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of the work to be undertaken and an estimate of the probable cost. This report was furnished. Thereupon a sum of five thousand ducats was granted, to which was added another three thousand ducats in 1446, and the work of building commenced the same year.

The palace was well advanced in 1451, when a great part of it collapsed. This misfortune did not discourage the Vicenzans; on the contrary, by redoubled efforts, they succeeded in getting the interior finished by 1477, and in 1494 the exterior. Afterwards, a large square was cleared in front of the structure, in order to provide a site worthy of its magnificence.

However, it was evidently written that this palace was not built to stand. Vicenzan writers tell us that the whole of one side was in ruins in 1496, in consequence of chains too small and columns too thin—"fu tutto per difetto delle catene di ferro che erano troppo sottili e delle colonne di sotto," as we read in a document of 1496.

Thereupon a celebrated architect of the Republic, Antoine Riccio, of Venice, who built the famous giant's staircase in the Ducal Palace, was sent for, and his advice was to rebuild entirely a large portion of the palace. Prolonged discussion followed, till at last, in consequence of an infamous charge, Riccio, in 1498, had to flee the State, and was succeeded by Georges Spaventa, who made some restoration on a design of his own. Then came Jacques Sansovino, whose ideas were rejected precisely as were those of Sebastien Serlio, Michel Sanmicheli, and Jules Romano.

Thus nearly all the most celebrated architects of Italy were consulted, which shows the importance of the question we here desire to solve, and the interest the Vicenzans attached to their palace.

The failure, justified or not, of the architects mentioned above made the fortune of Palladio, who, in 1545, submitted his ideas, radical, no doubt, but which were supported to some extent by the judgment of Riccio. At this time Palladio was very young, even if we accept the date of his birth given by Gualdo. He presented a draft of what he considered was necessary to be done to restore the structure.

It is proper to state that since Riccio had given his advice, matters had changed very much for the worse. The whole of the other side of the building was in ruins, and from this time it was no longer a question of a total reconstruction or not. A radical solution was necessary, and the work was given to Palladio, whose drawings had demonstrated that he was thoroughly alive to the exceptional gravity of the problem.

In 1549 Palladio commenced work on the Basilica (this Latin name was used in his time) which was not finished till the close of his life, and for this reason the Basilica of Vicenza is always closely associated with his career.

It is curious to note that the Basilica which occupies the first place in the fame of Palladio is not altogether in his style. It does not resemble the Rotunda nor the Venetian churches, nor the Valmarana Palace, nor the stage of the Olympic Theatre—all Palladian construction par excellence. One might complain of too much uniformity—the motif reminding one of Sansovino in the celebrated Library of St. Mark, built at Venice in 1536.

It goes without saying that Palladio was obliged to adapt his design for this building to the old framework that existed, yet he is criticised for having made the ground floor somewhat stunted in comparison with the elegance of the principal story, with its columns rising on pedestals. But here enters the question of height, which Palladio could not alter, and, besides that, the conditions called for the abandonment of pedestals. The discord between the upper columns upon pedestals and the small circular columns of the lower arcade would not have escaped any one. Palladio, like Vignola, Serlio, Sanmicheli, Jean Bullant, Philibert Délorme, raised the column sometimes on a square plinth upon a pedestal, but in this case reason and necessity dictated to the architect the abandonment of any square plinth in order to afford the public a freer passage.

It is well to bear in mind that Palladio had very just ideas on the use of pedestals. He writes that columns without pedestals are preferable to those with them, as the latter obstruct the entry, whereas columns starting from the pavement add to the grandeur and magnificence of the building. Be this as it may, a severe critic must recognize in the Basilica of Vicenza the majestic "ensemble," the beautiful details, the exquisite taste and elegant sobriety of the profile of the capitals, and of the entablatures, which form one of the principal attractions of Palladian architecture.

The success of the Basilica opened for Palladio the road to more important commissions. Before this he had lived in obscurity, and his previous work, the Godi Palace at Lonedo, that of Pisani at Bagnolo, finished in 1544, did not decide his future fame in the same way that the Basilica did, and for this reason, I assert, it was then that he made his début.

It is not necessary here to do more than refer to our architect's important works, and among the more magnificent and celebrated constructions of Palladio is one that must be placed by the side of the Basilica—the Rotunda, a beautiful detached villa built on a sunny eminence in the suburbs of Vicenza, and rising like a beautiful flower amidst the fresh verdure of the country. It was built after the Venetian manner, with a circular central hall. Hence the name Rotunda.

The plan is a cross, the angles of which are filled with quadangular chambers, and on each arm of the cross is a portico of five light columns, surmounted by an entablature decorated with modil-



THE CHURCH OF THE REDEEMER, VENICE.

The façade is embellished by four composite columns which support an entablature, above which is the pediment with acroteria and statues. The two wings are ornamented with an inferior order of Corinthian pilasters, the entablature of which surrounds the façade, and over the two aisles, following the slants of the roof are carried two half pediments which abut against the columns of the principal order. The arched doorway is square-headed and the tympanum consequently is blind.

The façade was built after the death of Palladio, under the superintendence of Scamozzi, following, it must be remembered, the plans

left by Palladio, and to Scamozzi also was entrusted the construction of the cloisters, commenced in 1579 and continued after the death of their designer by an artist named Bortolo—a clever stone carver, and finished only in 1617.

The cloisters, although much less known than the church, are quite as fine, and it would be well were they removed from the oblivion into which they have fallen. They consist of 140 columns: two and two and four and four (at the corners), and the design may very well be held in equal esteem with the best work of Palladio. I regret I cannot reproduce it, and I am not aware of any engraving or photograph of it. I may add that among all the panegyrists of Palladio there isn't one who gives the praise it deserves to the cloister of St. George.

All, however, agree in the extremely favorable opinion they give of the Holy Venetian Church of the Redeemer, the foundation of which was laid by Palladio in 1576. According to current opinion, this is his most remarkable church—a true masterpiece. Perhaps this judgment is partial, because, to say the least, it is cold, flat, uniform, and reminds one of the façade of St. George more than is necessary. The interior, nevertheless, has a solemn and majestic aspect, excepting some details, which are not up to the standard of Palladio's reputation. Like the Rotunda, the Church of the Redeemer has had its poet—viz., Lord Byron, who wrote that when the Capucins assembled to sing in this church it presented to him a scene more religious, more poetic and more picturesque than any Christian temple he had ever visited. This is, of course, a personal opinion and cannot be discussed. Artists have their preferences, and while Byron loved The Redeemer, Foscolo preferred the Dome of Milan, and Shelley that of Pisa.

In the opinion of architects, The Redeemer is a church properly and clearly designed, and its sumptuous appearance always appeals to us.

We have cited the Church of the Charity, and it is here, in the cloister, the actual residence of the "Academy of Fine Arts," that the solemn and elegant architecture of Palladio triumphs. Founded in 1561, and destined for the Lateran Canons, Palladio, as he himself wrote, aimed at imitating the house of the ancients, "La casa degli Antichi," of which he gave a careful description in his "Architecture," from which it appears he thought a great deal of this style of construction. Unfortunately only a part of the building remains. The Corinthian "Atrium" was, with another side of the building, burnt in 1630, but from what remains one can easily imagine it must have been an edifice of the first rank. Writers in general greatly praise the "tablinum" which formed the sacristy of the church, and although one cannot altogether agree with Querenghi, who, in a

letter addressed to the Venetian architect, Selva (who lived in the second half of the 18th century), says that this part was above all praise. Still its sober beauty is admirable, and among the works of Palladio it is particularly interesting.



PALAZZO CHIERICATI, VICENZA.

Returning to Vicenza, we shall find other edifices of Palladio, though not of the first rank, if we accept current opinion, with the exception of the Olympic Theatre, of which we shall speak. It may be proper to remark even in a short study like the present that we



PALAZZO THIENE, VICENZA.

shall endeavor to select only the finest works. And the first edifice worthy of remark, after those already referred to, is the Palace Chiericati, designed by Palladio for Valérie Chiericati in about 1565, and finished after the death of the architect. It is a delicate construction, almost aerial, and simple in composition.

The open intercolumniations gives it a light appearance, as though of metallic construction. In the middle of the second story the order is filled in with windows, and the latter are surmounted by statues almost in the same way as the Ducal Palace at Venice. This results in the superposition of solids over voids, and, from the point of view of apparent stability, is an arrangement not to be encouraged. Nevertheless, in architecture one must not go beyond the reasonable in

insisting on adherence to structural reality merely because the apparent is not the real.

In short, the Chiericati Palace is a little jewel, and, having been restored in 1853-4 by Miglioranza, is, since 1855, the museum of the city. Since 1870 (after being enlarged) it has remained as it is at present.

In another place of importance, the Palace Thiene, the Vicenzan architect gives us a work of altogether different aspect from that which usually distinguishes it. In this place (unfortunately also unfinished, being only one-fourth built by Palladio), one recalls his contemporary Sanmicheli, and his use of rusticated stone work. Purists remark that in a building where rusticated stonework is adopted, the use of the Corinthian order is arbitrary. Those of our confrères who hold that artists should be free in the treatment of their creations will pay small attentions to these details.

The windows of the ground floor in the Thiene Palace are particularly well designed, with their rough stone headings, above each of which an arch springs, the voussoirs of which articulate with the blocks of stone of the wall. It is not here a question of the Palladian style. On the contrary, Sanmicheli made use of this treatment even more than Palladio, and to-day it is still employed in Italy, particularly in the provinces where classical taste prevails: in Tuscany, for example.

Palladio, who altered the architecture of the Romans to suit the exigencies of his time, touched the extreme limit of classic expression in the Palazzo Valmarana and in the Palazzo del Capitanato at Vicenza. The foundations of the Valmarana Palace were laid in about 1566, but only a third part of the structure was finished. In this place, as well as in the Palazzo del Capitanato, opposite the Basilica, Palladio designed a composite order of pilasters, with windows between the columns. We do not understand—we Italians, with our ideas of suitableness—what purpose is served by these large pilasters, which appear of no rational utility. Palladio, who reasoned on architecture more than we do, ought, we think, to have asked himself: Are not these pilasters, with such extremely long intercolumniations, out of scale with the windows? And their functions here is simply decorative. They form no part of the interior construction; in fact, from the point of view of construction, they are a pleonasm, and if in imagination you remove them, the façade, which did not need them, would gain in simplicity and clearness. Here we have a sort of portico, filled with walling and pierced with windows—a poor addition of modern ideas to an ancient conception. It is perhaps also a condemnation of this motif of Palladian architecture that it has been frequently employed by modern architects, although perhaps a more rational use of it is made in North America than in



PALAZZO VALMARANA, VICENZA.

Italy. Neither can we praise these corners in the Valmarana Palace with the little pilasters below and that statue—a kind of caryatid—above, two decorative details absolutely out of scale with the pilasters which fill up the façade. The disproportion which we have just referred to is more noticeable geometrically than in perspective, and, the angles of the palace could only be defended, taken as they are to-day, if the façade were continued with a repetition of the pilasters.

The extreme classic style of Palladio in all its force is evident in another Vicenzan construction—viz., the Olympic Theatre, to which I have already had occasion to refer, and which at present is visited by tourists as a museum or decorated church. It is again a case of

a building left unfinished at Palladio's death, and for which he furnished the designs in 1580, the order for which he received from the "Most Noble Academy of Olympians," founded at Vicenza in 1555.

It should be understood at once that the purpose of this academy was not confined to studies of literary questions. Sometimes the



THE OLYMPIC THEATRE, VICENZA.

programme included the reciting of some classical tragedy. At first use was made of wooden theatres, among which was a celebrated one designed by Palladio in 1562. But the Academy, desiring to possess something lasting after the style of the ancients, entrusted the building of a permanent structure to Palladio.

This theatre is built on an elliptical plan, with seats rising naturally

from the stage, one above the other. At the foot of the steps is the orchestra, and above rise 28 Corinthian columns decorated with an entablature (not too rich), and with a balustrade ornamented by statues. On the other side, opposite this composition, is the front of the sumptuous stage, decorated with an architectural motif of two parts and an attic, divided by columns and demi-pilasters. In the intercolumniations, which are not open, are placed niches containing statues. The architectural design of the niches consists of classical windows with engaged columns, entablatures and pediments.

In the attic or upper story are figurative compositions and a large escutcheon. The ceiling which exists to-day was painted by Jean Picutti in 1828 (the old one being removed, as it was falling to pieces), in imitation of the velarium of the Roman theatres.

The theatre was built by Scamozzi in 1582, to whom we are also indebted for certain constructed perspectives to be seen in the open intercolumniations and in the arched opening of the centre of the stage, which is enriched also with statues not only in the niches, but in front of the columns also of the second story. The statues represent the old founders of the Academy.

The architectural composition of the Olympic Theatre has the same elegant and solemn air which all Palladio's work possess, and creates a certain impression notwithstanding that the forms may be repetitions. Thus this theatre is one of the most singular monuments in Italy, and a most important example of what the love of "tradition" may accomplish by the resuscitation of dead forms.

If one should speak of all the edifices built or projected by Palladio, all the counsel and advice he gave to those Italian cities which sent for him—Venice for the Ducal Palace, Brescia for the Public Palace, Bologna for the Basilica of Saint Petronio, Rome for the Basilica of St. Peters—we should fill an entire volume of the Architectural Record alone. We have, therefore, confined ourselves to those which more particularly exemplify his brilliant talent and inventive style.

Palladio, "Il buon Palladio; il gran Vitruvio nostro," is one of the most important men which the sixteenth century has produced—not so much for his work as for the influence he exercised; and of this influence and of his best pupils we will—amongst other matters—endeavor to treat in the second half of our study.

Alfredo Melani.

Milan, Italy.

THE PROBLEM OF THE LEANING TOWER OF PISA.*

THE study of the architectural phenomena of mediaeval Italy, which has furnished matter for seven magazine articles, including the present one, was originally suggested to the writer by his interest in the Leaning Tower of Pisa. As this interest prompted the beginning of these studies in 1870, and the continuation of them in 1895, it may properly furnish a title-heading for an essay on the problem of the vertical leans and bends, especially in façades, of Italian mediaeval exteriors.

Properly speaking, this essay should be entitled, "The Problem of the Leaning Façade of Pisa," for it is to this feature of the Cathedral that its matter will be mainly devoted. I have nothing new to offer directly, as regards the construction of the famous Leaning Tower, but the facts to be brought out do seem to bear upon its problem and perhaps they offer a solution of its mystery.

II.

To those interested in the curiosities of art and the wonders of travel, it is tolerably well known that the leaning Bell Tower, or Campanile, of the Pisa Cathedral, which is 179 feet high and 13 feet out of perpendicular, has been alternately regarded for several centuries as a freak of constructive daring and as a curious result of the operation of ordinary natural forces. There is a traditional belief that the Tower was built to lean, and there is also a traditional belief that the Tower settled.

Which belief is the older and consequently the authentic one is unknown, and the opinions of modern authorities have been more or less evenly divided.

If the compendiums and encyclopaedias of recent date be reckoned up, the weight of opinion will tend to favor the theory of accident; but this seems only to result from the fact that a compendium naturally takes the easiest way out of a difficulty, is naturally conservative, and naturally unimaginative. The people who build compendiums have not generally the temperament of people who build leaning towers, and consequently do not understand them.

If the recent multitude of unimaginative books, which copy what may be most easily found in other unimaginative books, be left out

*All photographs used in illustration were taken by John W. McKecknie for the Brooklyn Institute Survey, excepting Figs. 2, 12, 15, 19, 21, 23, 25, 26.



FIG. I.—THE LEANING TOWER OF PISA.

Taken from the upper gallery of the Cathedral choir, to show the well, in which the Tower stands.

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of consideration, there is no doubt that a very respectable and authoritative mass of opinions could be collected to the effect that the Tower did not settle and was originally built as it stands.

We quote the work of Ranieri Grassi, "Descrizione di Pisa e Suoi Contorni" (1837), as one of those giving grounds for this faith, in very explicit detail; all the arguments being from matter of fact observations of the masonry construction.

Ricci's "Storia dell Architettura in Italia" is a standard history of Italian mediaeval architecture, and Ricci also has taken sides in favor of an intentional construction, after presenting the arguments of both parties to the dispute. (Vol. I., p. 577.)

On the other hand, it must be admitted that no argument which can be regarded as completely crushing scepticism, has ever been advanced, and that no philosophy of an intentional construction excepting that of pure caprice or daring, has ever been advanced. It is an illustration of this uncertainty, that, as recently as 1884 or 1885, an American architect, Mr. C. H. Blackall, undertook to settle the question by excavations about the foundation of the Tower, which excavations the authorities, having first permitted, subsequently deemed it wise to interrupt, as possibly endangering its stability.

It has just been noted that there are two traditions regarding the Pisa Campanile, and that it cannot be said which is the older. It is, therefore, especially important to point out that the earliest literary mention of a settlement is that found in Vasari's "Lives of the Artists."

In Vasari's "Life of Arnolfo di Lapo" (Vol. I. of the "Lives"), it is said that: "These two architects [Guglielmo and Bonanno], having little experience of the soil of Pisa, did not sufficiently secure their piles, so that the Tower sank before it had attained half its height, and inclined over the weaker side, leaning six braccia and a half out of the direct line, according to the declination of the foundation. This declination is not much observed below, but is very obvious in the upper part, and has caused many to marvel that the Campanile has not fallen or at least exhibited rents."

Subsequent accounts, which often unhesitatingly mention settling foundations as the cause of the lean, are either based upon Vasari's story, although they rarely or never mention their authority; or else they are founded on a peculiarity of construction, which appears to have been the only basis for the story, but which is susceptible of a wholly different interpretation from that which has been put upon it.

The Leaning Tower of Pisa curves toward the perpendicular above the third story, by a delicate series of changes in the pitch of the columns on the lower side, several of the galleries being also built slightly higher on this side. (Fig. 2 best shows this curve.)



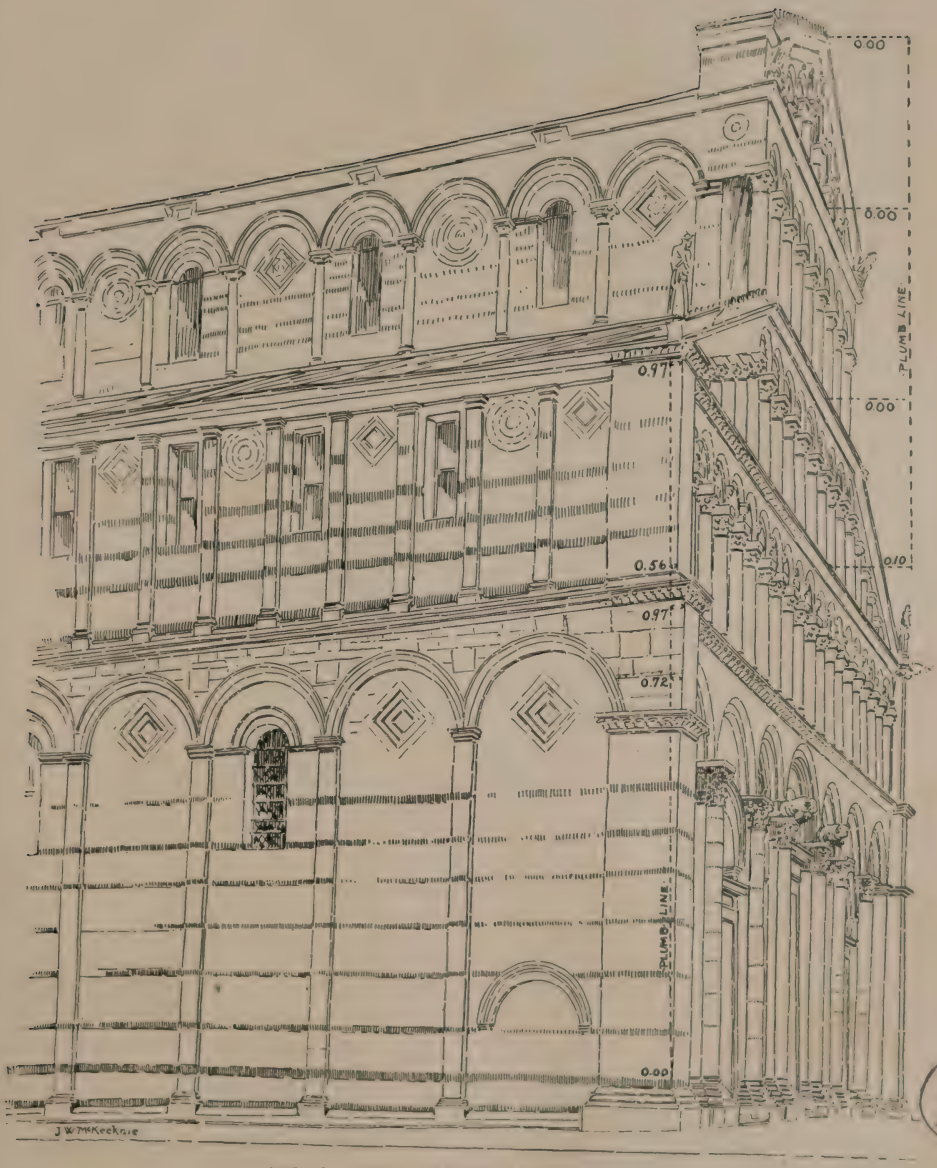
FIG. 2.—THE LEANING TOWER OF PISA.

From the point of view best showing the return curve toward the perpendicular.

Hence a presumption that the Tower settled when the third story was reached, because the changes of direction toward the perpendicular in the upper stories are supposed to represent an adventurous acceptance of the hazardous position of the building with such correction toward the perpendicular direction as was subsequently possible. Thus Murray's Guide-Book says: "There can be little doubt that the defect has arisen from an imperfect foundation, because an effort has clearly been made to bring back the upper part to as vertical a direction as possible."

It will put quite a different point on this matter to show that curving leans are found in a number of buildings of this period, under circumstances which make the hypothesis of a settlement occurring before the completion of the building, and corrected by a bend toward the perpendicular during erection, a wholly untenable one.

It is probable that Vasari's account was suggested by the appearances mentioned in Murray. As there is no earlier literary mention of a settlement, we shall observe that Vasari wrote his account four hundred years after the building of the Campanile, which dates from 1174. Meantime (since 1400), the Renaissance indifference to mediaeval art, and the Renaissance misconceptions of it, had infected Italy, while the disasters and depopulation which had befallen Pisa date back to the thirteenth century. In Vasari's days the marriage of the daughter of the Grand Duke of Tuscany was celebrated by white-washing the mediaeval frescoes of the Florence Cathedral, and this is a suggestion of the attitude then prevailing toward mediaeval art. To these causes, Renaissance taste, and the Pisan decadence, we may attribute the weakening of a tradition regarding



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FIG. 3.—THE LEANING FACADE OF PISA

Drawing by John W. McKecknie, made over a survey photograph.

the actual facts, which has notwithstanding persisted down to the nineteenth century.

As to the theory of settlement during construction, there are three drawbacks.

It seems doubtful that masons would have been willing to risk their lives on a tower that had leaned over thirteen feet before the topmost gallery was added, or that workmen would have dared to lift to its summit the seven heavy bells, one of them weighing six tons, which hang there. It seems doubtful that an architect would have so gambled on the chances of the quicksand coming to terms at the proper moment. It seems doubtful that such a quicksand *would* have come to terms at the proper moment, for all time following.

All parties are united on the point that the building has never moved since it was finished. Altogether this was a most obliging quicksand. The sceptics of the nineteenth century will strain at a gnat and swallow a camel. It is easier for them to believe in a quicksand that has been steadfast since the twelfth century than to believe in a constructed leaning tower. All of which is a matter of temperament.

III.

It is a proposition of the writer that among the people of the Middle Ages there were certain daring spirits of an unconventional and possibly refractory disposition, who happened to be engaged in the business of architecture; the Rudyard Kiplings of their time, but having a different medium of utterance; and that these gentlemen were familiar with certain Italo-Byzantine subtleties of habitual but inconspicuous departures from the perpendicular line in building. Hence, on occasion, such eccentricities as the Leaning Tower of Pisa.

The main element of our problem is to prove our own facts; which, being proven, the Leaning Tower of Pisa will take care of itself; as it always has done, being, as it is, the greatest monument in history of hatred for the Philistine and of scorn for the formalist.

And the facts to be proven are held to be these, that there are indubitable evidences in Italo-Byzantine masonry of a habit of substituting vertical bends for mathematically true perpendiculars, and that in exteriors, especially façades, there are cases of bends which begin with a delicate forward lean and which then curve or straighten back to the perpendicular.

Of this class appear to be the façades of the Cathedral of Pisa, of S. Michele at Pavia, of S. Ambrogio at Milan, and the choir of the Pisa Cathedral. The façade of the Cathedral of Ferrara has a forward lean, but apparently without the returning bend. There are



FIG. 4.—THE CATHEDRAL OF PISA.

Aside from the façade this picture shows the downward obliquity of the north transept string-course, which is repeated in reverse direction on the south transept. See survey measurements on Fig. 5. It also shows the curves in plan of the upper north wall. As these curves are potentially due to thrust or accidental movement, they have not been quoted in the article devoted to mediaeval curves.

several other façades in Italy which would be quotable cases of the lean and return bend, subject to careful re-examination, when a probability had been fairly established for constructive intention in one particular case. Observations on the masonry and measurements at Pavia, Milan and Ferrara will be offered after the cases at Pisa have been fully described.

The instances of greatest value, at present, and for an introductory argument, are those of the leaning façade and leaning choir of the Pisa Cathedral. (Figs. 3, 18.)

There seems to be no escape from the conclusion that there is certainly one leaning façade in Italy which was intentionally built both to lean and to bend to the perpendicular. The facts were originally observed by me in 1870, and were originally published in "Scribner's Magazine" for August, 1874, under the heading "A Lost Art."

In 1895, five or six weeks' time were devoted to a survey of the Cathedral of Pisa, in which I had the assistance of two architectural students, whose opinions coincided with my own as to the lean-

ing façade. Measurements were made and photographs taken to support the conclusions reached and the results are offered here. There was probably not a day during the time mentioned in which some attention was not given to the problem of the façade. This amount of careful study was not due to doubts of our own, but to the anticipated doubts of others; of the habitual and professional doubters of the nineteenth century.

The preliminary and essential facts are offered by Fig. 3. Owing to the variety of profiles in cornices and base-moldings and the varied projections of wall surface, connected with the arcade decorations, it is not possible to offer connected measurements at any one point from top to bottom of the façade.

The whole main lower wall along the whole front below the first gallery, leans out evenly and uniformly to an amount which is represented by the measures entered, in foot decimals, on the great corner pilaster at the northwest angle.

As appears from these measures, up to the beginning of the first gallery the forward lean is about one foot (.97) at the angles, and holds at that ratio, for the given height, in the masonry surfaces (arcaded and unarcaded) of the façade proper.

At the first gallery the angle pilaster steps back, so that it is only .56 forward of the face of the lower pilaster at its base, and the whole amount of the lean at the top of the upper pilaster is thus again found to be .97; when measured to the same perpendicular which has been taken for the lower pilaster. The sum total of the lean forward of the upper pilaster, taken by itself, is .41 (.97 — .56).

By adding these two measures; .97 for the lower story and .41 for the upper pilaster, we obtain an approximate estimate for the lean of the continuous main front (as distinct from the separate leans of the upper and lower angle pilasters) in its two lower stories, viz., 1.38, or about seventeen inches. That is to say, if there were a member at the pavement corresponding to the projection of the cornices of the first and second galleries, the lean outward of the upper cornice would have about that amount.

Above the second gallery the measures are entered on the main front itself (Fig. 3). The third gallery leans forward .10; or a little over one inch; and the two upper galleries are plumb.

The height of the two lower stories is slightly in excess of that of the three upper ones (Fig. 4). Thus it appears that the whole lean of the façade is about eighteen inches, of which seventeen inches belong to the lower half; that the three upper galleries are practically plumb and the two topmost ones wholly so.

By looking at the ground-plan (Fig. 5), it will be best seen what forcible projection is given to the bases of the pilasters at the angles of the façade. If a plumb-line be dropped from the apex

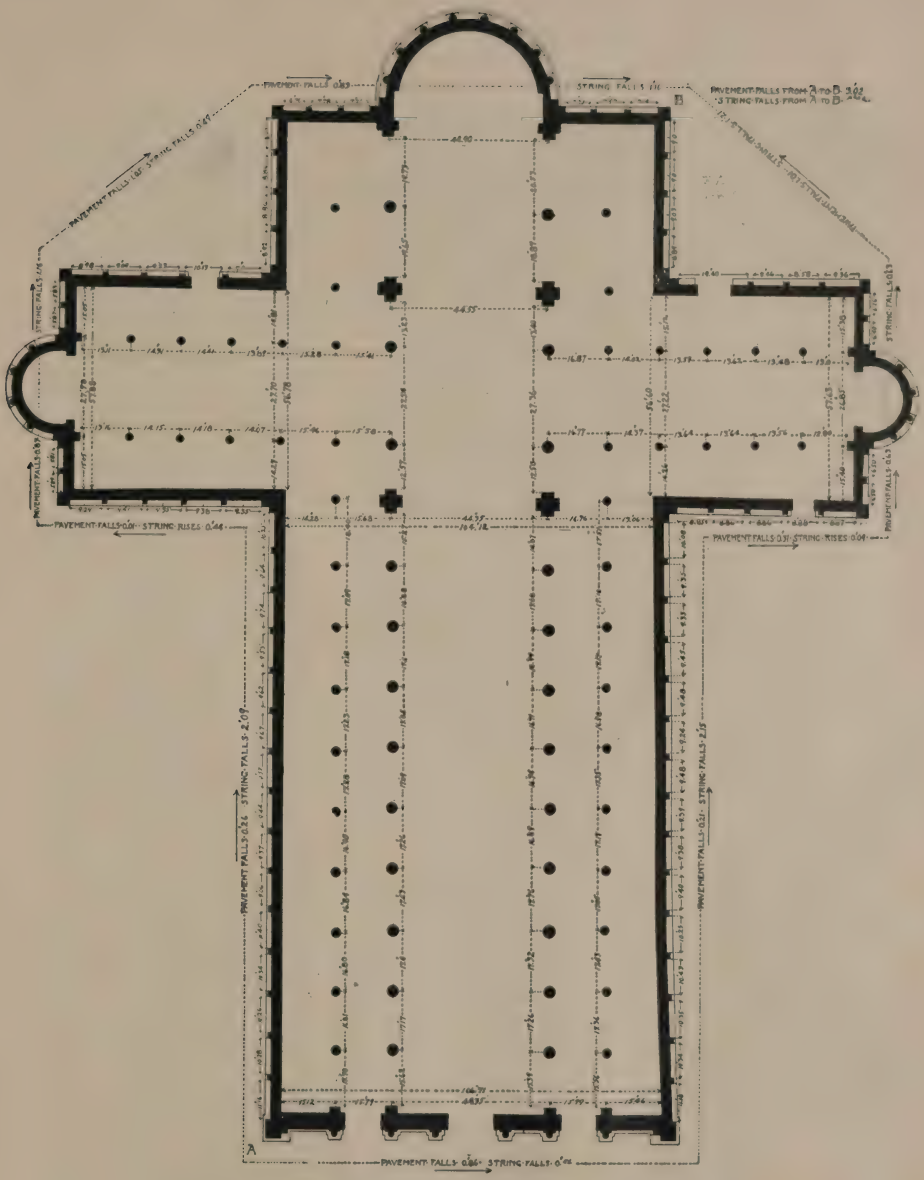


FIG. 5.—GROUND-PLAN OF THE PISA CATHEDRAL.

To illustrate the reinforcement and projection of the angle pilasters and plinths as compared with the lower line of the main façade. The upper main façade does not lean beyond the angle base mouldings (outer line). On this plan are also entered the levels of the pavement, as compared with the levels of the string-course above. On north and south sides the string-course drops about two feet. On the transepts the string-courses drop in opposed directions.

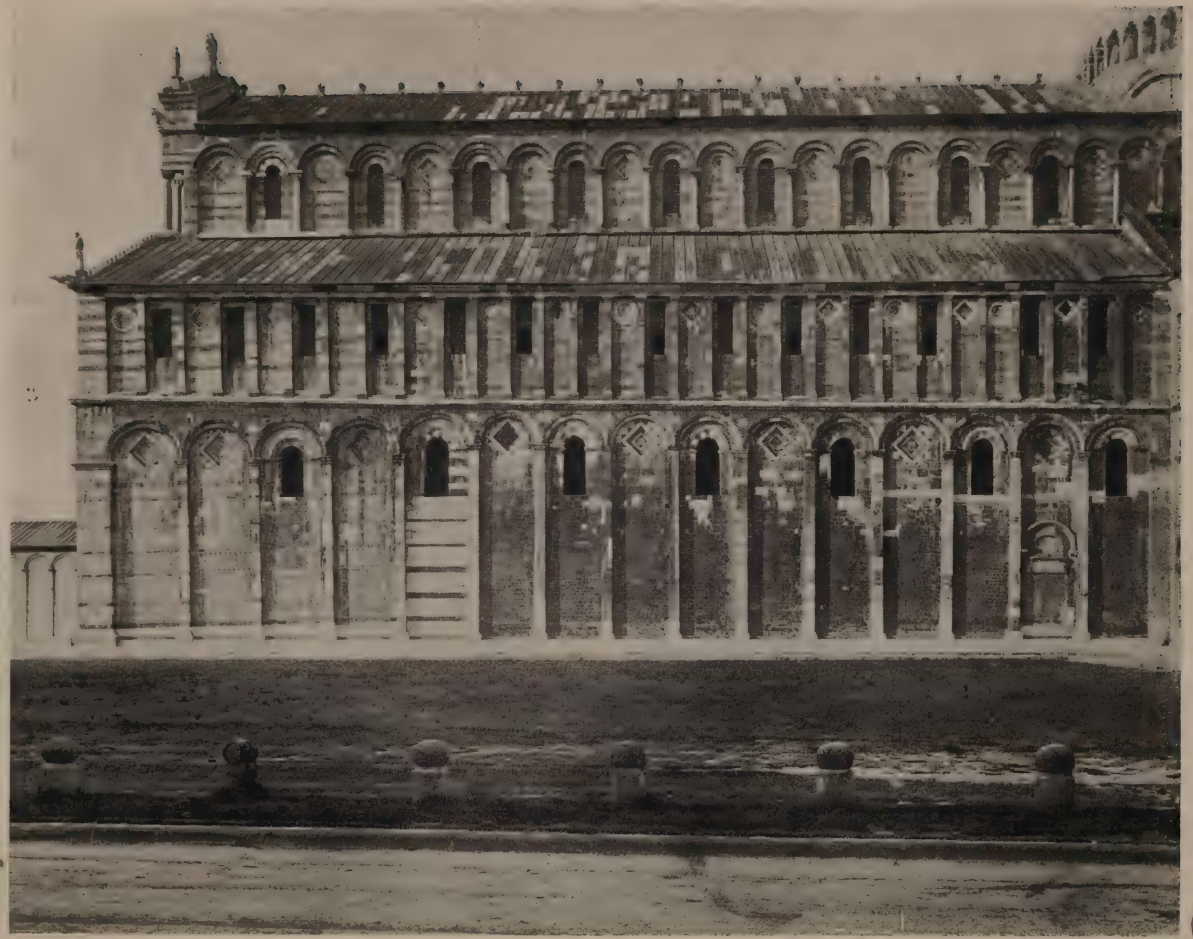


FIG. 6.—SOUTH WALL OF THE PISA CATHEDRAL.

Photographed in parallel perspective to show the obliquity of the string-course. The levels are entered on ground-plan, Fig. 5. The measures to plinth line are entered on elevation, Fig. 10. Note also the downward bend of stripes, arcades and caps at the fifth bay. For measurements see Fig. 13.

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of the façade to the pavement, it will strike a point which is on a line with the exterior lines of these bases. Thus, from the standpoint of physics, or of the centre of gravity, the façade is absolutely secure and might be said not to lean at all—in the sense that the topmost cornice moulding does not project beyond the outer line of the plinth blocks at its angles. This is an important fact, when joined to those which follow, showing an intentional construction.

We will now debate the question of settlement, not forgetting that the soil of Pisa is said by geologists to be peculiarly unstable and that quicksands and a treacherously spongy soil are consequently elements to be soberly reckoned with. If settlement occurred, it is evident that outside of a one inch settlement, it was all over when the third story of the façade was finished—a happy accident—similar to the one experienced by the Tower, and to which the Pisan builders must have grown so accustomed as to take it for a matter of course, for it will appear that a similar accident also befell the choir.

But the wonder grows when it appears that even for these two lower stories there must have been at least two separate settlements, and at least one for each story. To show that this must have been the case we will turn to the surveys and photographs of the side walls. (Figs. 6, 7, 8, 9, 10, 11, 13 and 14.)

Beginning on the south side of the Cathedral (Fig. 6), we notice at the fifth bay from the façade a downward bend of the masonry striping, which begins close to the plinth line at the pavement and continues in all courses as high as the capitals of the pilasters.

On the north side of the Cathedral (Fig. 7), we see the same bend at the same point, viz., the fifth bay from the façade.

As the blocks of masonry which form these stripes enter the angle pilasters at a right angle (Figs. 8, 9), it is clear that the obtuse angles of the masonry stripes at the fifth bay on both sides of the church are connected with the leaning façade in such a way that if settlement occurred, it began at the fifth bay.

We now return to a fact brought out by a preceding article (Vol. VI., No. 2), and now shown by surveys in detail (Figs. 10, 11) as well as by photographs.

Although the masonry stripes bend down on both sides at the fifth bay, there is a continuous rise of the central string-course on both sides of the Cathedral, amounting to about two feet, on each side, in the distance between the transepts and the façade. The small photograph, Fig. 12, shows this slope of the south wall string-course in a very emphatic way. It is very clearly seen for the north wall in Fig. 7. The slope is photographed in parallel perspective, and with absolutely scientific accuracy in Fig. 6. The accurate levels for this slope are entered around the outlines of the ground-

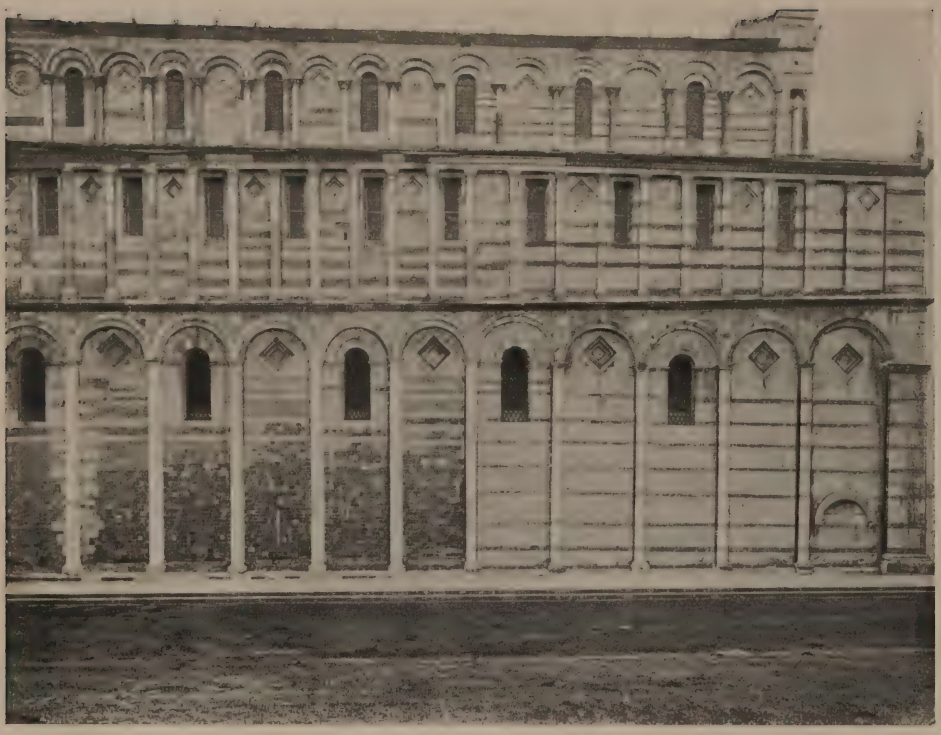


FIG. 7.—NORTH WALL OF THE PISA CATHEDRAL.

Showing the oblique string-course and the downward bend of stripes, arcades and caps at the fifth bay. For levels see Fig. 5. For measurements to plinth see Figs. 11 and 14. The string-course curves up toward the façade. The gallery roof-line shows a rising curve in elevation, which is partly constructive and partly an optical effect of the curve in plan shown by Fig. 4.

plan, Fig. 5. The measurements from plinth to string-course for the south wall are entered on Fig. 10. The level measurements for the obliquity of the north wall string-course are entered on Fig. 11. The variations of measures as between levels and plinth measures, and as between north and south walls, will appear from these surveys to be unimportant and we will again mention the obliquity of both north and south string-courses as closely two feet. Figs. 13 and 13A are enlarged sections of Fig. 10, on which the measurements are more easily read.

Thus the string-courses rise obliquely upward toward the façade throughout their whole extent, while the black and white masonry courses fall obliquely as high as the capitals, in the given five bays.

Clearly the settlement supposably represented by these masonry courses did not extend as high as the string-course. Therefore it follows, if there was settlement at all, that there were two settlements; because the angle pilasters lean forward above this string-course. (Figs. 3 and 8.)



FIG. 8.—THE LEANING FACADE OF PISA. SOUTHWEST ANGLE.

Showing in detail the masonry of the south wall. Note the downward direction of stripes, the upward direction of string-course and the downward direction of stripes above the string-course. Compare survey measurements, Fig. 13.

Let us next examine the masonry above the oblique string-courses, and it will immediately appear that the lean of the second story is constructive. In Figs. 6, 7 and 8, we can see the black masonry stripes entering the upper corner pilasters at a right angle and contrasting in their downward direction with the rising obliquity of the string-course below them. If we examine the detail photograph, Fig. 9, which includes the first black masonry line above the string-course of the north wall, we shall see that every block is cut in converging lines, or in wedge fashion. The same cutting of wedge-shaped blocks is seen in multitudes of blocks just below the string-course, showing how its obliquity was obtained.

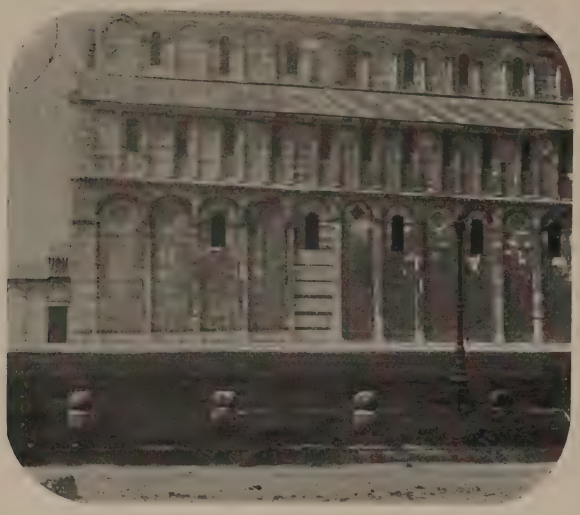


FIG. 12.—SOUTH WALL, PISA CATHEDRAL.
Showing the oblique string-course.

çade such remarkable proofs in the way of measurements that we cannot resist the temptation to produce them.

Hence the surveys of the north and south walls, from the façade to the fifth bay inclusive. Figs. 13 and 14.

For the south wall consult, in Fig. 13, the measures as taken between the plinth and the lowest black masonry stripe. They are found to be at the fifth bay 2.37, and at the angle 1.25.

On the theory of settlement the sinking was therefore 2.37 — 1.25 = 1.12 (feet and decimals) between the fifth bay and the façade, for the masonry courses above the plinth line. By consulting the photographs, Figs. 6 and 8, it appears that the masonry courses continue to run in parallel lines up to the capitals.

We will now ascertain the amount of settlement of the pilaster capitals (Fig. 13). Beginning with the farther pilaster of the fifth bay and comparing its height with that of the corner pilaster we have a contrast of 31.04 and 28.32. Thus the settlement of the building on this line must have been 31.04 — 28.32 = 2.72. We have, therefore, the absurd result that the capitals settled 1.60 ; or *nineteen inches*; more than the masonry courses just under them.

We will next compare the measures for the arches, Fig. 13. The fifth arcade is 35.57 above the plinth, and the arcade next the corner pilaster is 33.98 above the plinth. Thus the settlement of the arcades would be 35.57 — 33.98 = 1.59. Consequently they must have settled 1.13 *less* than the capitals directly under them; all of which is absurd.



FIG. 13.—SURVEY OF THE SOUTH WALL, NEAR THE LEANING FACADE, PISA CATHEDRAL.

Enlargement of Fig. 10. Fig. 13A continues this section.



FIG. 13A.—SECTION OF THE SOUTH WALL, ADJOINING THE TRANSEPT PISA CATHEDRAL.

Enlargement from Fig. 10 and connecting with Fig. 13. A remarkable feature shown here is the drop towards the transept of the pilaster capitals, while the arches follow the string-course. Compare Fig. 13.

We will repeat the measures for the five bays next the façade on the south wall and leave the quicksand experts to struggle with them.

The masonry courses settled 1.12.

The pilaster caps settled 2.72.

The arcades settled 1.59.

If there was a settlement.

And if there was one, the string-course rose six inches in the same five bays just afterward; and after that the upper corner pilaster settled again, and all the adjacent masonry courses settled with it, for eight bays above the string-course. (See Fig. 6.) This amounts to saying, not only that there were quicksands at Pisa, but that the masonry of Pisa was a combination of putty and India-rubber as long as the building was going up, and that it grew to be like other stone directly afterward.

We will now apply similar tests to the theory of settlement for the first five bays of the north wall (Fig. 14). As measured to the plinth the first black masonry course gives 2.13 at the fifth bay, and 1.36 at the angle. Above this line the masonry courses are parallel, and they must have settled (if at all) .77 up to a point just under the capitals (2.13 — 1.36 = .77).

If we next compare the heights of the pilaster capitals, we find them *rising* .18 between the fourth pilaster and the angle (28.67 — 28.49 = .18). On the other hand, the last three arcades rise .70 (34.23 — 33.53 = .70). These facts cannot be reconciled with a forward lean of one foot (exactly .97) of the corner pilaster, as due to a settlement which began at the fifth bay, and it must have begun there, if anywhere.

The expert is now invited to re-examine the masonry of the north wall, as shown by photographs, Figs. 7 and 9, and to draw his own conclusions, without assistance either of argument or of ridicule.

Some interesting results are obtained by applying the measurements obtained at the angles to the details of the façade itself. See Fig. 4. As measured to the pavement, the right (S. W.) pilaster corner capital is .35 lower than the left (N. W.) corner capital. This appears by comparing the height at the angle of the pilaster capitals in the surveys (Figs. 13, 14). This variation is connected with a gradual drop in the line of capitals from left to right, as the photograph, Fig. 4, shows. But the cornice above, as measured to the pavement *rises* .30 from right to left. This appears by comparing the levels for pavement and string-course, as given on the ground-plan, Fig. 5 (.86 — .56 = .30). Therefore, the distance between string-course and pilaster capital on the right (S. W.) angle (Fig. 4) is .65 greater than the corresponding measure at the left (N. W.) angle.

It follows from the above measurements, if the theory of settle-



FIG. 14.—SURVEY OF THE NORTH WALL, NEAR THE LEANING FACADE, PISA CATHEDRAL.

ment be applied to them, that the first story of the façade had two lateral settlements in opposite directions, besides the forward settlements. If the measurements are taken to the capitals it settled one way .35, and if measurements are taken to the string-course, as compared with the capitals, it settled the other way .30, but not enough to bring the string-course level.

Finally, when the levels are taken on the first exterior gallery and on the interior gallery, which corresponds to it, it turns out that the façade settled laterally in opposite directions *at one and the same place* .24 in each direction. Mr. McKecknie is authority for these levels, which were taken with a very fine instrument, and they are supported by measures for the heights of the interior galleries which have been made to the pavement.

If one could fancy the Pisa Cathedral a ship at sea, these sideway rollings, and back and forth pitchings would be comprehensible. On dry land they have no parallel.

It would be a pity, however, to overlook the positive results which the measurements of this essay offer, aside from the light which they throw on the supposed yielding of foundations at Pisa. As contributions to the study of constructive asymmetry (see Vol. VI., No. 3), they are invaluable. Once more it may be said that S. Mark's at Venice offers the best parallel to the Pisa Cathedral, but in S. Mark's, owing to the roughness of workmanship, it is impossible in details of this kind to draw the line between such natural irregularities of hand-work as appear in old lace and in Oriental rugs, and intentional construction.* At Pisa the proofs of intention are definite. The term "symmetrophobia" may be fairly applied to these variations, and from this standpoint also, as distinct from debates as to foundations, geological formations, and earthquakes, some light, it seems to me, is thrown on the problem of the Leaning Tower. The Tower is wholly Pisanesque. If nature did it, it only did what human nature had already done at Pisa, and the Pisa Tower would only prove to be an accident that has a thousand intentional counterparts in the Cathedral. At Pisa culminated that remarkable amalgamation of Greco-Byzantine subtlety and mediaeval exaltation which, for centuries to come, may still puzzle and astound the weaklings and trucklers of later and decadent generations.

Attention is called to the wave lines of the pilaster capitals on the north and south walls, Figs. 10, 11. They lead us back to the problem and purpose of the curves considered in Vol. VI., No. 4. Remarkable counterparts are found at Santa Maria del Giudici near Lucca; remarkable, not in the sense that such wave lines are not found elsewhere; but remarkable in the sense that the modern sceptic has

*This remark is also made in the last article on the score of the interior masonry stripings of the Pisa Cathedral as compared with the irregularities of casing in S. Mark's.

a harder task than usual to scoff down the proofs of constructive intention. Photographs and surveys for the wave-lines at Santa Maria del Giudici are in the possession of the Survey.

Aside from the minor wave line the expert is requested to examine the great curve of the pilaster caps. on the south wall. The measures are best seen in Figs. 13, 13A. The curve (or bend) is best seen in Fig 10. The measures show the highest cap. (the seventh from the façade cap. inclusive) to be 2.79 higher than the façade cap. and 2.92 higher than the transept cap., and yet the arcades hug the string-course as far as the transept. Strange to say, this enormous bend of nearly three feet deflection wholly escapes detection in the total effect of the south wall. I was first made aware of it by the measures. One easily sees the drop at the façade, but in the direction of the transept it wholly disappears in the deceptive effect of the arcades.

It is evident from the measurements which have been offered that all question and doubts raised by later repairs of masonry disappear when these measures are considered in mass. As a matter of fact the plinth line of the Cathedral is new masonry throughout, excepting at the north-west angle (Fig. 9), and repairs for a foot or so above this line are quite general all around the building. There is a great deal of fresh masonry in the fifth bay on the south wall, and above this line there is occasional repair, but not much, in other quarters. The Survey possesses a series of photographs in 8 x 10 size and corresponding to the sections shown in Figs 8 and 9, which show the individual masonry blocks all around the building. It is easy to specify the repair blocks on these photographs by the freshness of surface and by the lack of weathering and discoloration. The method has been followed in these repairs by inserting fresh blocks as needed in each special instance, of size or height corresponding to those which have been removed. The Survey was also careful to take the actual surface levels on all sides of the building as well as the measures which were made to the plinth line. These levels are entered in detail on the ground-plan (Fig. 5) and are there connected with a summary for the levels of the oblique string-courses. The actual surface levels are also entered on the surveys for the north and south walls respectively. These remarks bear on the general attention which was given by the Survey to accurate detail.

Should the question be asked as to the motive of bending down the masonry stripes at the fifth bay from the façade, the answer is, probably, that the lean of the façade would have been more easily detected if the stripes did not enter its corner pilasters in rectangular blocks. In such a case every block of the façade would have been necessarily cut obliquely, and in angles which would attract every eye. Thus the lean would be instantly detected. At present it generally escapes notice. In the "Seven Lamps" the lean of the façade was noticed by Mr. Ruskin and is there attributed to settlement, but I am not acquainted with any other publication which mentions it. The fact was unknown, for instance, to a high architectural authority in Pisa, with whom I had the pleasure of conversing in 1895, and who was officially connected with the public monuments.

The bent stripes are more easily noticed, but the logic which connects them with the façade, in one proof for the constructive purpose

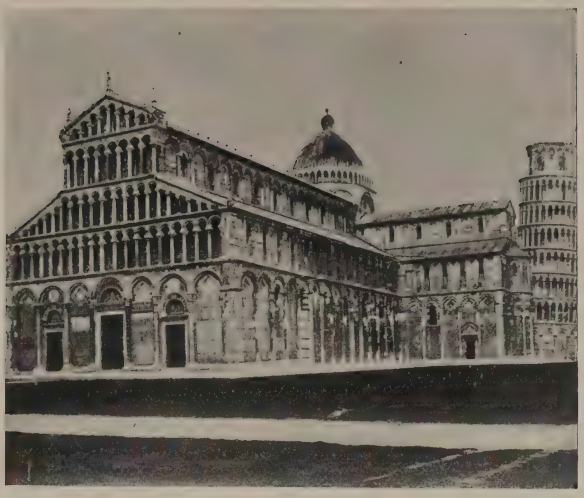


FIG. 15.—THE PISA CATHEDRAL.

From a point of view illustrating deceptive perspective results of the sloping string-courses.

of both, has hitherto escaped the perception of the lynx-eyed nineteenth century. Here again Mr. Ruskin has ascribed the distortion to a settlement of the façade. The bent stripes are themselves more generally overlooked than the photographs would lead one to suppose. They have their counterparts in the galleries of the Pisa Cathedral (Vol. VI., No. 3, Figs. 6, 7); in the clerestory cornices at Cremona (Vol. VI., No. 4, p. 502), and in the outer masonry of S. Alessandro at Lucca (for which the Survey has a photograph and a drawing, unpublished). They are, in my opinion, connected with the system of curves and bends treated at length in Vol. VI., Nos. 3 and 4, but have also here the special purpose of avoiding an instantaneous detection of the leaning facade, which would otherwise result from the use of striped masonry.

As for the oblique string-courses of the north and south walls of the Pisa Cathedral, which are, as described, each two feet out of horizontal, I have supposed them to have the purpose of building in perspective; for points of view similar to that of Fig. 15. Compare Vol. VI., No. 2. It must not be forgotten that there are slight obliquities in the corresponding lines of the transept string-courses, which drop to meet the side string-courses (see entries, Fig. 5); and this also suggests a perspective purpose. That certain perspective tricks were employed at Pisa in other buildings, and also otherwise in the Cathedral, is incontestable. I am, however, of the opinion that all such deflections produce an effect of optical mystification and of "life" independent of any direct effect of increased magnitude. If we admit a general fondness for obliquities and a general hatred for parallels

to have been common at Pisa, these string-courses lead us back once more to the problem of the Tower, and may be only another illustration of the spirit which prompted its method, if not its eccentric exaggeration.

The oblique string-courses are very generally overlooked by visitors to Pisa, as the eye tends to discount them from all points of view into the natural effects of another point of view. During my last stay in Pisa a very high French authority on Italian art consulted me on the point as to whether such an obliquity actually existed or whether he imagined it, which shows that it is not very conspicuous.

Another interesting feature of the north and south walls is the departure of the lines of arcades from the lines of the string-courses at the fifth bay. This is doubtless one more mystification, intended to avoid and break down the too obvious appearance of a rising obliquity. This mystification certainly had its effect on Mr. Ruskin, for in the "Seven Lamps" we find him stating his doubt, in facing the fifth bay of the south wall, *whether* the arcades fall or the string-course rises. The facts are that the arcades fall over a foot and a half, and that the string-course goes up six inches in the given five bays. On the north side it goes up a foot. See Fig. 14, where the measurement to a level is entered for this point.

In an earlier article we have presented the facts regarding the variations of arcade spacings on the given walls, and the proofs of constructive intention. These arcade spacings are entered on surveys 10, 11. On both walls the spacings diminish about two feet between the first and sixth bays. Finally, we shall not forget the curve in plan of the south wall. The survey of the curve is given in Fig. 5. A photograph of it was published in Fig. 6, Vol. VI., No. 4. The curves of the north wall have not been previously illustrated. Two of these curves are convex in plan, and begin at the second story (Fig. 4). Hence they are potentially open to the suspicion of thrust, and they were therefore omitted from my article on horizontal curves. The curves in elevation of the north wall are seen in the string-course and cornice in Fig. 7. These curves are in opposing directions, but the effect of a curve in elevation, which appears in the roof line, is partly due to an effect of the curve in plan, which is seen in Fig. 4.

As a final point regarding all preceding measurement it will be remembered that I have proven in Vol. VI., No. 3, that the limit of error due to carelessness of the Cathedral masons can be stated as between eleven-hundredths and three-hundredths of a foot. Consult the arcade spacings of the transepts in Fig. 5, which tally within these limits.



FIG. 16.—NORTHWEST ANGLE OF S. MARK'S, VENICE.
Showing a delicate forward lean and return bend.

IV.

It will probably be conceded, after the publication of this Paper, that the Pisa Cathedral façade leans by construction. Once more: What may have been the purpose?

Possibly the bend or curve should be considered as the essential fact rather than the lean. From this point of view we find a constructive tendency which is sympathetic with the use of vertical curves, bends and leans in interiors. (Vol. VII., No. 1.) There are no straight vertical lines on the exterior of S. Mark's at Venice, excepting at the southwest angle, where the recent restoration has been



FIG. 17.—PORTION OF S. MARK'S FACADE, IN PROFILE.

By sighting from foot of the picture the lower columns are seen to show a forward lean. The front column leans outward 1¾ inches.

made. Aside from restorations, the vertical lines of the exterior of the lower main façade are, to my observation, all delicate forward leans, with a return above to the perpendicular. This appears, for instance, at the unrestored northwest angle, Fig. 16. The lower columns along the main front, aside from restorations, all appear to lean forward slightly. For instance, the front left column in Fig. 17 leans forward $1\frac{3}{4}$ inches in a height of eight or nine feet. The columns above are either brought back to the perpendicular or leaned slightly backward. This can be seen in Fig. 17 for the farthest columns, by holding the bottom of the picture to the eye and sighting down the page. I have also noticed this disposition of upper and lower columns on the choir of the Troja Cathedral.

It is difficult to pin down the sceptic by a conclusive demonstration in every one of these cases, but having pinned him down at Pisa as to the façade, I take the liberty of saying that possibly the system of vertical curves or of forward leans and return bends, was a fre-



FIG. 18.—PISA CATHEDRAL.

Showing a forward lean of fifteen inches and return bend in the profile of the choir. (The levels of the string-course for the whole circumference of the building are entered on Fig. 5.)



FIG. 19.—FACADE OF S. MICHELE, PAVIA.
The whole façade leans out about a foot, with return bend.

quent one in Italo-Byzantine art. On this head witness the following facts:

Mr. Heins, of Heins and LaFarge, has shown me among his photographs an indubitable case of constructed vertical exterior curves (without lean) at the angles of the choir of the Cathedral at Verona.

The choir of the Pisa Cathedral has an outward lean of fifteen inches with a return bend to the perpendicular Fig. 18). The amount of this lean, as revealed to me by plumbing from the upper gallery, with careful reference to discounting differences in the projections of cornices and base mouldings, was an entire surprise. It had escaped the notice of our party of three during four weeks' work

on the Cathedral. This plumb was taken after Mr. McKecknie left Pisa and the announcement of results was an entire surprise also to him.

It subsequently turned out that our own photographs included this fact. Fig. 18 shows this lean and return bend, but not very successfully, as the picture was not taken for the purpose and therefore does not give the details sufficient magnitude. There are absolutely no partings or cracks in the adjacent masonry, and these would have been inevitable in case of accidental settlement.

We may, for the moment, best continue to debate the purpose of the leaning façade at Pisa, by stating additional facts for other buildings. The façade of S. Michele at Pavia offers a fine instance of the forward lean and return curve. Our picture (Fig. 19) showing this façade does not illustrate the facts, and I have explained in the last Paper that no Survey photographs were taken at Pavia. By plumb from the lower window on the centre of the façade the lean of the walls was found to be six inches up to that height. The lean is continuous and uniform for all piers and wall surfaces. The whole front is about two and a half times higher than the point from which the plumb was taken. The front continues to lean above this point, gradually curving back toward the perpendicular, and the whole lean was estimated at eleven or twelve inches. There are no repairs to speak of on the façade, and the directly adjacent side walls are all ancient masonry without breaks. Here partings and cracks would have been apparent if the façade had settled, but it seems incredible that a façade should settle in a curve which bends back to the perpendicular, for no thrust could extend to the piers at the angles. Fig. 20 shows the cutting *of one block* in the right doorway of the façade. A similar cutting at the joints of blocks was noticed elsewhere on this façade.

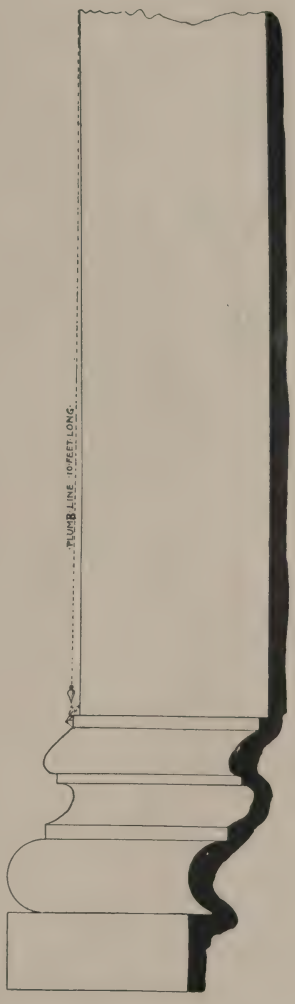


Fig. 20.—Block cut to a lean in the right portal of the façade of S. Michele, Pavia.

The façade of S. Ambrogio at Milan, Fig. 21, leans out nine inches,



FIG. 21.—FACADE OF S. AMBROGIO, MILAN.

The façade leans forward about eighteen inches, with return bend, according to memory.

by plumb to the base of the first gallery. No plumb was taken above this point. The lean continues with a return bend (my notes add that the record for the bend is *from memory*). The whole façade is about two and a half times as high as the gallery plumbed and the entire lean will be about eighteen inches.

It appeared to me here that the masonry might have moved slightly in the upper story to exaggerate the constructive lean, but the lower story is tied in by cloister arcades of the same age as the church.

Counterparts of such bends have been noticed hastily in Ss. Giovanni e Paolo at Bologna and in S. Agostino at Cremona.

The façade of the Cathedral of Ferrara, Fig. 22, has a most pronounced forward lean, apparently without bending back. No other case without the return bend is known to me. By sighting on a cord held in the hand the lean was estimated by Mr. McKecknie at nine inches, but comparison of our photograph with other and better known measurements would suggest that this estimate is too low. As the photograph shows, there are no cracks in the side masonry, which appeared to me wholly ancient.

The leaning façade of the Volterra Cathedral may be a dubious



FIG. 22.—THE LEANING FACADE OF FERRARA.

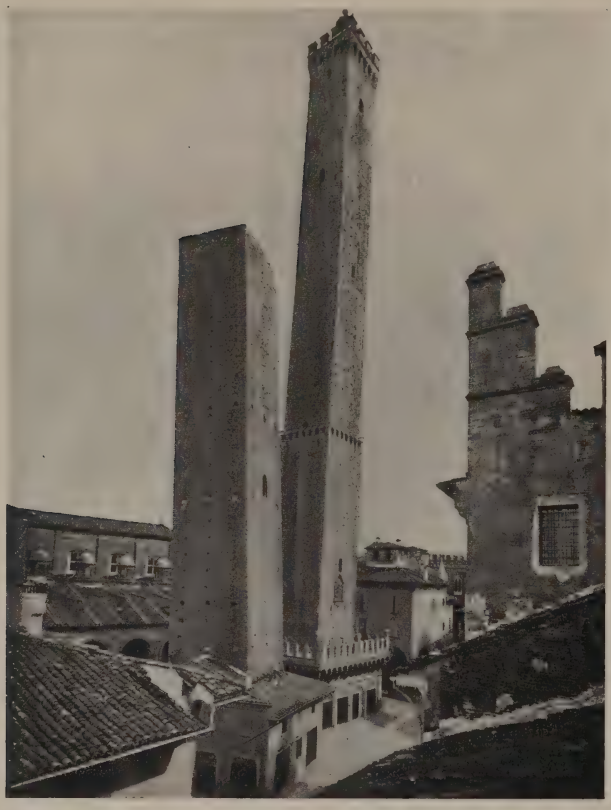


FIG. 23.—THE LEANING TOWERS OF BOLOGNA.

case. One side wall has undoubtedly yielded here and although there are no signs of settlement for the front, the side wall makes one suspicious. This church was, however, begun by Niccolo Pisano, which again tends to make one credulous. For the buildings ascribed to Pisan architects, when employed away from home, invariably show some of the peculiarities which have been usually ascribed to earthquakes, quicksands and other natural forces at Pisa. This holds at Volterra, as it does at Prato, Orvieto and Siena. Movement of the masonry appears probable in the façade of S. Pierino at Pisa, and of S. Simone Juda at Lucca.

V.

So far it might appear, and especially from the exterior of S. Mark's, that the vertical bends of façades are to be understood from the point of view which has already been suggested for the horizontal curves, and for the entasis, as more elastic and vital, less formal, and less rigid than straight lines. In other words, the bend and not the

lean would be the vital fact, especially as a receding bend, back of the perpendicular, would be clearly an artistically weakening and disagreeable resort for the effect of a façade.

Another, or an additional, explanation is suggested by the purpose which led Michael Angelo to build in a forward lean to the rear wall of the Sistine Chapel before undertaking the Last Judgment. The fact, not the purpose, is mentioned by Vasari, but this purpose was obviously to present the painting to the eye on one plane and without foreshortening of the upper figures. From this point of view the bending back to the perpendicular in mediaeval façades would be for the sake of stability, but the effort would be to present the façade to the eye as far as deemed safe, without foreshortening.

In such construction there must be also an illusion of greater magnitude. In the gallery colonnades of the Pisa façade, for instance, the eye will be accustomed to a given amount of foreshortening for a given height and in so far as this effect is counteracted by a forward lean the eye will conceive greater magnitude for the columns than is the fact.

Those who have studied the wonderful details of the animal carvings which decorate the cornices of the Pisa façade will understand the possibility of a wish to have them seen without foreshortening. The same point of view might hold for the carvings of S. Michele at Pavia (Fig. 19), and for the details of the façade of Ferrara (Fig. 22), but cannot be conceived for the façade of S. Ambrogio.

On the whole, according to my observation, the leaning of façades will have been a comparatively rare occurrence in Italian mediaeval art, and there is no doubt that the Pisa façade is the one which offers altogether the most remarkable illustration of delicate and careful construction, as well as the most thoroughly convincing proof of purpose, whatever that purpose may have been. It is important to remember that constructed leaning faces, including intentional outward leans, have been found in ancient Greek construction by Penrose.

Vitruvius directs that the entire temple façade shall have a forward lean, but no ancient example of the construction has survived.

VI.

The proposition has already been advanced that the Leaning Tower is the work of an age, whose men of genius were more apt to express their eccentricities or daring qualities in architecture than in literature. Given such instances of caprice as we find in the bent column of Arezzo (Vol. VII., No. 1) or in the corkscrew-shaped spire of Gelnhausen, near Frankfort-on-the-Main, and given additionally a habit of building inconspicuous leans, like that of the Pisa Cathedral



FIG. 24.—TORRE DEL PUBBLICO, RAVENNA.

Leans on two sides and is built with a batter on both leaning sides.

façade, for subtle and aesthetic purposes; it is then evident how the Leaning Tower of Pisa may have originated. To this suggestion we can add the corroboration that constructed leaning towers actually were built in other cases.

Those at Bologna are generally conceded to have been constructive (Fig. 23), although Murray's guide book ridicules this theory. Baedeker says of the Garisenda, which is 163 feet high and 10 feet out of perpendicular, that "it is probably one of the few leaning towers in Italy whose obliquity has been intentional." It is of this tower that Goethe says in his "Italian Journey:" "I explain this folly to myself as follows—In the time of civic tumults every great building was a fortress for which every powerful family raised a tower.



FIG. 25.—TOWER OF S. NICCOLA, AT PISA.

This tower has a delicate continuous curve toward the perpendicular; not well illustrated by the picture.

Gradually this tower building became an affair of honor and of pleasure. Every one wished to boast of a tower, and when finally the upright towers became too commonplace the leaning ones were built. And both architect and owner reached their aim. We overlook the multitude of upright towers and seek out the leaning ones." This idea gains force when we recall the report of the mediaeval Benjamin of Tudela that there were 10,000 towers in Pisa. This report is accredited by conservative modern authors. The little village of San Gimignano, near Siena, still boasts thirteen towers.

The Torre del Pubblico at Ravenna is an instance which has probably not previously been noted by any publication as a constructed



FIG. 26.—VIEW OF THE LEANING BAPTISTERY OF PISA.

leaning tower. It is built on both the leaning sides with a batter, and the brick masonry is all manifestly of one date and of homogeneous construction. This batter appears in a photograph which was purchased in Ravenna and has been slightly emphasized in a drawing made from the photograph by Mr. McKecknie, who has not seen the original (Fig. 24.) This batter must contemplate a reinforcement on the side of the lean, belonging to the original construction, and seems to make out a clear case of intention.

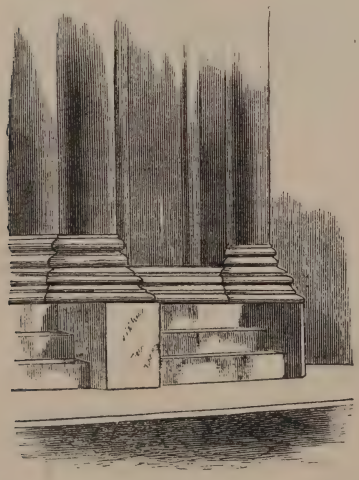


Fig. 27. Detail to show the base courses of the Pisa Baptistery. The levels of Fig. 28 were taken at the plinth blocks.

VII.

It has been observed that the Leaning Tower of the Pisa Cathedral curves towards the perpendicular and that this probably suggested the story of a settlement and subsequent attempt at rectification, which has found credence with various writers since the time of Vasari. But there is another bell tower in Pisa, that of S. Niccola, which was built by Niccolo Pisano, which also leans *and which also curves* toward the perpendicular. This tower now stands in such contact with other buildings that no conclusions can be drawn ex-

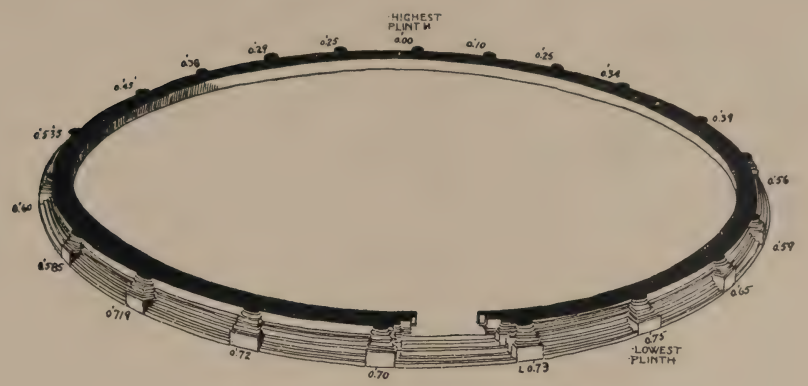


FIG. 28.—LEVELS OF THE BASE COURSES, PISA BAPTISTERY.
They tilt downward nine inches in the general direction of the lean.

cept from the curve. Our Survey omitted to take a photograph of this tower, owing to haste and want of time after finishing other surveys, but I have found a photograph among the pictures owned by Messrs. Heins and La Farge in which the curve appears. As its existence in the building is attested by the eyesight of three observers it has been thought best to reproduce the photograph, Fig. 25, although in the published dimensions the picture is only available as calling attention to a fact which has been attested by observations of the original building.

There are no theories of quicksand experts or of engineers to explain why a completed tower should settle in a curve bending from the base toward the perpendicular, and it is not likely that the remarkable explanation suggested by Murray for *the* Leaning Tower ever had its counterpart in another building. Moreover, the curve of this tower is delicate and continuous, and is not produced by a successive straightening up of different stories of columns as in the Cathedral Campanile.

VIII.

That the Baptistery of Pisa leans is not generally known. There is an art dealer of much intelligence in Pisa whose establishment is at the corner of the Via S. Maria and the Piazza del Duomo. He spends much of his leisure time on the corner, looking over towards the Baptistery, but he was much astonished when I showed him this lean, and it would thus appear that it is not generally known in Pisa. Fig. 26 shows the facts as they are seen from this corner, but it must not be forgotten that the forward lean of the Cathedral façade tends to accent and exaggerate the lean of the Baptistery. A rough calculation goes to show that this obliquity amounts to about seventeen inches.

I will now submit the survey for the levels of the base courses of the Pisa Baptistery, Fig. 28. How these base courses are actually arranged does not clearly appear from the drawing which gives the levels.

Hence the drawing (Fig. 27) for the lower masonry courses. Here it appears that the height of the plinth blocks at which the levels are taken represents the height of three courses of masonry above the pavement and below the profiled moldings.

If the builders of the Baptistery had wished it to lean they would probably have laid out the kind of foundation which the levels of the plinth blocks *prove that they actually did lay out.* These foundations tilt downward evenly and gradually exactly nine inches (.75) in the direction of the actual lean.

It would be a tenable idea that the Pisa Baptistery (begun 1153); as contrasted with the Tower (begun 1174); represents an adherence to the subtler methods found in the choir and in the façade of the Cathedral. It would be impossible to resist the conclusion, if this inconspicuous lean of an entire round building be admitted as constructive, that we have in such leans one more illustration of a subtle dislike for mathematical formulas, of a wish to give a subtle variety and interest to the building.

It is difficult to resist the conclusion that the Leaning Tower is the work of bold and daring artists adopting, in their own aggressive spirit, methods which had long been practiced in less conspicuous ways.

Wm. H. Goodyear.

THE NEW LIBRARY OF CONGRESS:

A STUDY IN DECORATIVE ARCHITECTURE.

THE new building of the Congressional Library draws such crowds of visitors that the cause of this popular interest is well worth seeking. Month after month, all through the Spring of 1897, this absolutely naked building, without even a seat in it, except in the rotunda, and without a table, a book-case, a single book or portable work of art on exhibition has drawn visitors in crowds. The officers of the Watch in the building tell you that the average is fifteen hundred visitors a day, but it might well be greater than that and not surprise one who has noted the ingress and egress of the sight-seers. It is certain that the handbook which has been published by Messrs. Curtis and Cameron, of Boston, has been a very successful undertaking, very large editions of it having been sold. The photographs of the building also sell very largely; not only Mr. L. C. Handy's excellent and cheap pictures, from which, with one or two exceptions, the illustrations of this article are drawn, but also the admirable "Copley Prints," by Messrs. Curtis and Cameron, the subjects of which are generally the wall paintings which are so numerous and so splendid in this favored structure.

It is undoubtedly true that the edifice, with its adornments, attracts more visitors in its capacity as a National building, and one situated in Washington, where sight-seeing is the order of the day, than it would if a building in private or in state ownership, and if located in one of our commercial cities. Nevertheless, the interest which this great crowd takes in the decoration of the building, its long and curious study of the details and the evident enjoyment which it takes in the novel spectacle of a building really rich and refined in its decorative character, is an inspiring one to any person who hopes for the growth of a living interest in fine art.

The history of the building as a monument is rather complicated. Messrs. Smithmeyer and Pelz were the designers whose plans were accepted, ten years ago. In 1888, General Casey, Chief Engineer of the Army, was put in charge of the work, and Mr. Pelz continued as one of the chief designers. Mr. Bernard R. Green was the engineer in charge at this time and continues still in control of the building. In 1892, Mr. Edward Pearce Casey, son of General Casey, was appointed architect and director of the adornments of the building. The architectural work was far advanced when he undertook it, and much of the ornamental detail of the interior had been designed

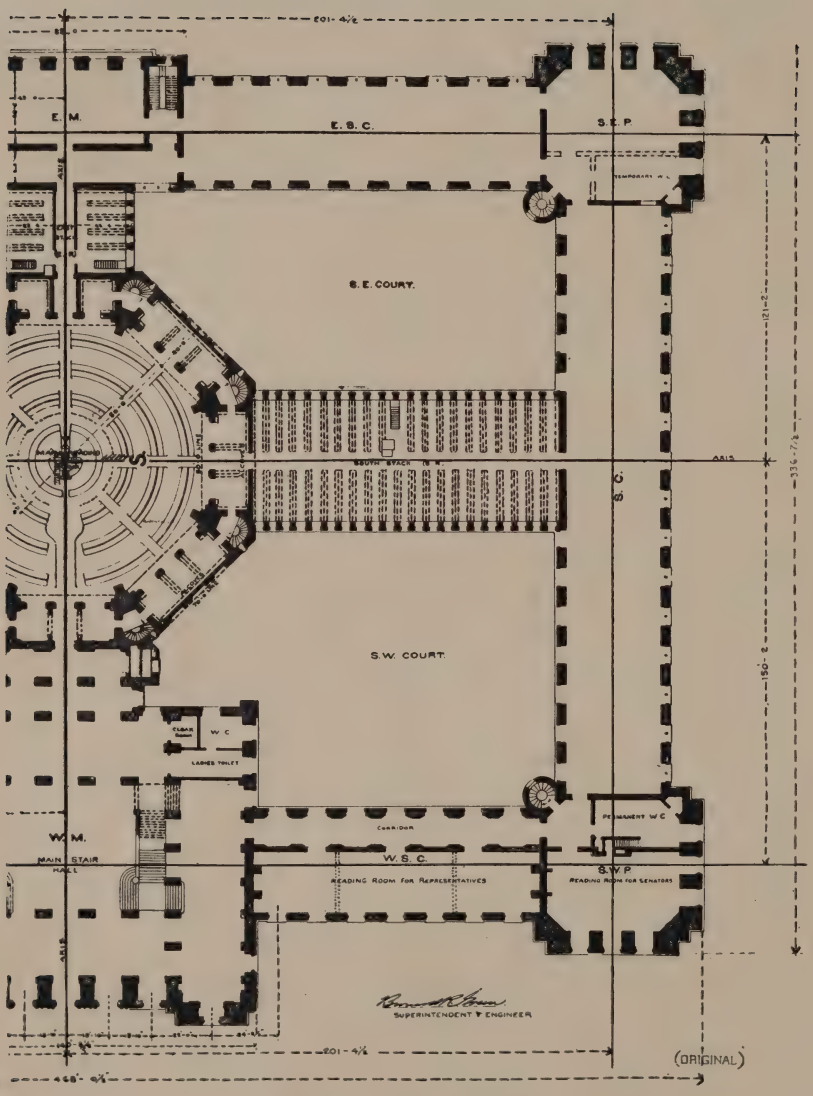


FIG. I.—FIRST FLOOR.

BOSTON PUBLIC LIBRARY

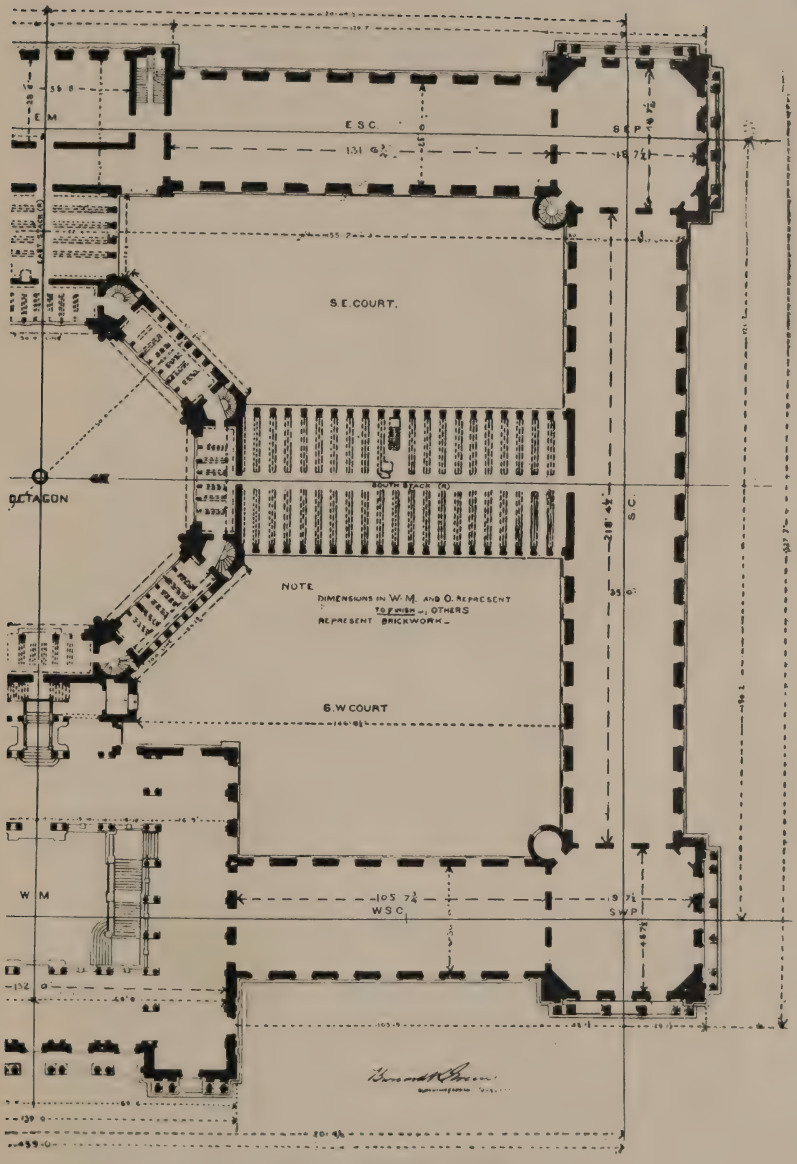


FIG. 2.—SECOND FLOOR.



FIG. 3.—VIEW FROM N. W.

before his advent, even when put in place under his direction. It will be seen, then, that the question as to who designed any given capital, or frieze, or entrance-way may be difficult, and, yet, in each individual case it is not hard to discover, beyond a doubt, whose design a given part of the building embodies. This much, at least, is certain; Mr. Casey has had the chief direction of the ornamentation furnished by the eminent sculptors and painters whose work is, perhaps, the chief attraction to the larger part of the visiting public; while the purely architectural details are more commonly the work of the earlier directors of the undertaking.

The plans of the building, Figures 1 and 2, suffice to show its general arrangement, for the wing not given in each plan is precisely like the one on the opposite side, except that in the first story plan the arrangement of reading-rooms for members of Congress is not repeated in the northern wing. The view of the exterior taken from the northwest, which is given in Figure 3, should be studied in connection with the plans, that one may gain an intimate sense of the arrangement of the whole structure. The plans show how the reading-room occupies the greater part of the central octagon; with alcoves around this for students and also for the reference library; the octagon being 140 feet wide over all, or very little smaller than the British Museum reading-room; although the dome itself, in the American example, is carried on piers far within the perimeter and is brought down to 100 feet. The stack-rooms reach from the octagon to the curtains, on the north, south and east; while on the west there is only space for a double lobby between the octagon and the Entrance Pavilion. The general plan may be considered economical, practical, such as to utilize aright the abundant space allowed the building, but it gives no evidence of being part of a strong architectural conception. The exterior, which results from it, is of no real consequence, except for its detail. It is not, of course, of any great value as a work of art, in its general system or distribution. The dome is not very dignified nor very graceful. The great portico with coupled columns resting on a second basement and adorning a central pavilion is neither very novel nor very impressive considering its size and costliness, and the side pavilions are notably feeble and inconsequent. That false idea of grandeur which consists mainly in hoisting a building up from a reasonable level of the ground, mainly in order to secure for it a monstrous flight of steps which must be surmounted before the main door can be reached, has prevailed here as in other buildings erected by the government. It is not quite so great an offender in this respect as the Capitol, but the same spirit is in it. The curtain walls between the pavilions, with their long rows of uniform windows with their frontons alternating round and pointed is a common property of the conservative architect's office,

and these are neither better nor worse than scores of their congeners in the cities of the Union. There is, however, some architectural appropriateness of general plan and design, a certain fitness of the building for its purposes which, though not visible to the spectator who approaches the building and looks up at it, may yet be guessed at by the comparison of the bird's-eye view with the plan. The courts are very spacious and the walls are not so high proportionally as to shut out light, even from the basement windows. The walls of the courts are everywhere faced with brick, but with granite enough interspersed to lead up properly to the granite superstructure of the great central pavilion and the smaller pavilions as well. That is to say, as it had been decided in advance that the attics of all these pavilions should show walls of granite on their side to correspond with the rest of the exterior, this topping-out with granite is provided for within by the free use of the same material in the lower walls of the court. The stack-rooms, north and south of the great octagon and the small stack-room to the east have very simple fronts on the great courts, the windows arranged in regular vertical rows with scarcely any break between the openings, and these rows alternate with continuous solid piers, the whole forming just the design that should be given to an office building in one of our commercial cities. The sash are all fixed and there are outside galleries for the necessary cleaning of the glass. A certain number of books will be accommodated in the octagon itself, in the alcoves which surround the great reading-room, and the arrangement is such that two millions of volumes can be perfectly well housed in the stack-rooms plus these alcoves. The great rooms in the curtains and those rooms, also large, though not so large, in the four corner pavilions, are mostly left at present for the undetermined purposes of the future. The rooms of the upper story are elaborately adorned, the pavilions with paintings of considerable significance, the curtain galleries with merely decorative coloring. In the first story, also, the rooms and corridors on the west front to the north and to the south of the main stair-hall are both decorated with paintings of importance. All these rooms as here enumerated may be taken as museum-rooms—as exhibition rooms—as rooms in which the artistic and historical treasures of the Library may be exposed, and those not named above, that is to say, the greater number of the large halls in the first story may be taken as appropriated for special libraries and for general work of cataloguing books, packing, binding and the rest of the private business of a great library. It is evident, however, that there is vastly more room in these halls than is likely to be required for all these purposes taken together. After all the services of a vast public library have been provided for in the first floor and the basement, and after all the conceivable needs of exhibition room

shall have been filled, there will still remain a great deal of space which for generations to come may look in vain for a proper use. It is, therefore, entirely reasonable, what the managers of the building tell the visitor—namely, that while the present stacks will hold two millions of volumes, a not radical change in the building will provide fully as much space in addition. Now, it may be interesting to note that accommodations for four millions of volumes would just about house the greatest library in the world—namely, the National Library at Paris; for this great establishment is put down as holding about two million and a half of bound volumes with, perhaps, a million pamphlets and the like, and some twenty thousand portfolios and folio books in the department of prints. That great library possesses also collections of MSS. and of coins and medals and other antique treasures of art which the Library of Congress can never hope to include among its possessions. The conclusion seems to be that the whole great library of Paris, always excepting those of its possessions which form no part of the library in the strict sense, could be housed in the building now existing in Washington. As for the dimensions of this structure, if any New Yorker is curious to know just how big it is, let him walk around the distributing reservoir, on the site of which the New York Public Library, composed of the Astor, Lenox and Tilden Foundations, is to be erected. The lot of ground on which the reservoir now stands is almost exactly as large as the Library building at Washington, for this latter measures 468 feet in length, outside the first story walls, and 336 feet, 7½ inches in depth.

The exterior of the building is not very richly adorned with sculpture, but there are a few works of importance, such as the reliefs in the spandrels above the three main entrance-doorways. These, which stand for Literature, Science and Art, are the work of Mr. B. L. Pratt, whose work we shall find again in the interior of the building. A reference to Figures 5 and 6 below will aid the reader at this point. In the circular windows within the great colonnade of the entrance pavilion are portrait busts by three different sculptors, Messrs. Herbert Adams, F. W. Ruckstuhl and J. Scott Hartley. Above, in the attic of the Entrance-Pavilion, and where the angles of this large structure are emphasized by secondary pavilions of slight projection, two rounded frontons, having each its tympanum filled with sculpture in high relief, and two vigorously modelled telamones to support it are the work of Mr. William Boyd, who appears also to have modelled the strongly-emphasized band of ornamental sculpture above the portrait busts and behind the Corinthian columns of the central colonnade. All this sculpture is well subordinated to the building, except, perhaps, the broad band of decoration last named, concerning the propriety of which there may

be grave doubts. The very considerable display of enriched capitals, both of columns and pilasters—of festoons around labels and of arabesques above windows, is effective in making the Entrance-Pavilion an enriched and brilliant one instead of the cold pseudo-classic embodiment of formulas which it might so easily have been; but none of this sculpture is of first-rate importance in itself. Much less effective as a part of the building, however interesting in a scientific way, are the "ethnological heads" which are carved upon the key-stones of the lower row of arches. All of this sculpture, together with the bronze doors, tells upon the exterior; and yet the exterior is not a very important piece of decorative architecture; chiefly because no one intelligence has been called in to combine this very considerable amount of valuable material into a common whole. To rightly discuss and criticise this exterior, we should have to lay before our readers at least a dozen photographs of detail because of the importance of this detail in itself; but even then, we should have to end as we begin by the statement that the detail is not so used as to make up with the building proper an important architectural composition. It is a kind of warning of what is to come when it is said, roughly, that the building is rich within and plain without; while yet it has to be said that there is so much detail of some value lavished upon the rather plain outside.

A word must be said about the great double perron and its approaches, for if this rather absurd means of expense and display must be admitted, it is well that it should be made as superb as possible; and it cannot be denied that the great "stoop" in question is very well distributed. The plan, Figure 4, shows the general disposition of this great flight of steps with the carriage-drive which, mounting a slight ascent, passes under the great platform of entrance and allows persons descending from vehicles to enter the front doors of the basement story. Figure 5 gives a general view of this very sumptuous system of approaches, and suggests the magnificent opportunities there are for the placing of statues on the twenty-four pedestals, more or less, which are not occupied by bronze lamp-stands. The Fountain of Neptune, the work of Mr. Hinton Perry, is shown in this view, Figure 5, and Figure 6 shows the same fountain in detail, but with the disadvantage that the water is drawn off. The definite level fixed for the water may be supposed to be about where the frogs are seated, so that the great eel in the foreground will be about half submerged. It is hardly fair to judge this fountain until the water-jets are playing and the bronze figures are seen through the mingled veil of water in mass and in spray. Moreover, according to the description in the handbook, there are still more figures to be put in place.

The building may be entered on the basement floor from which

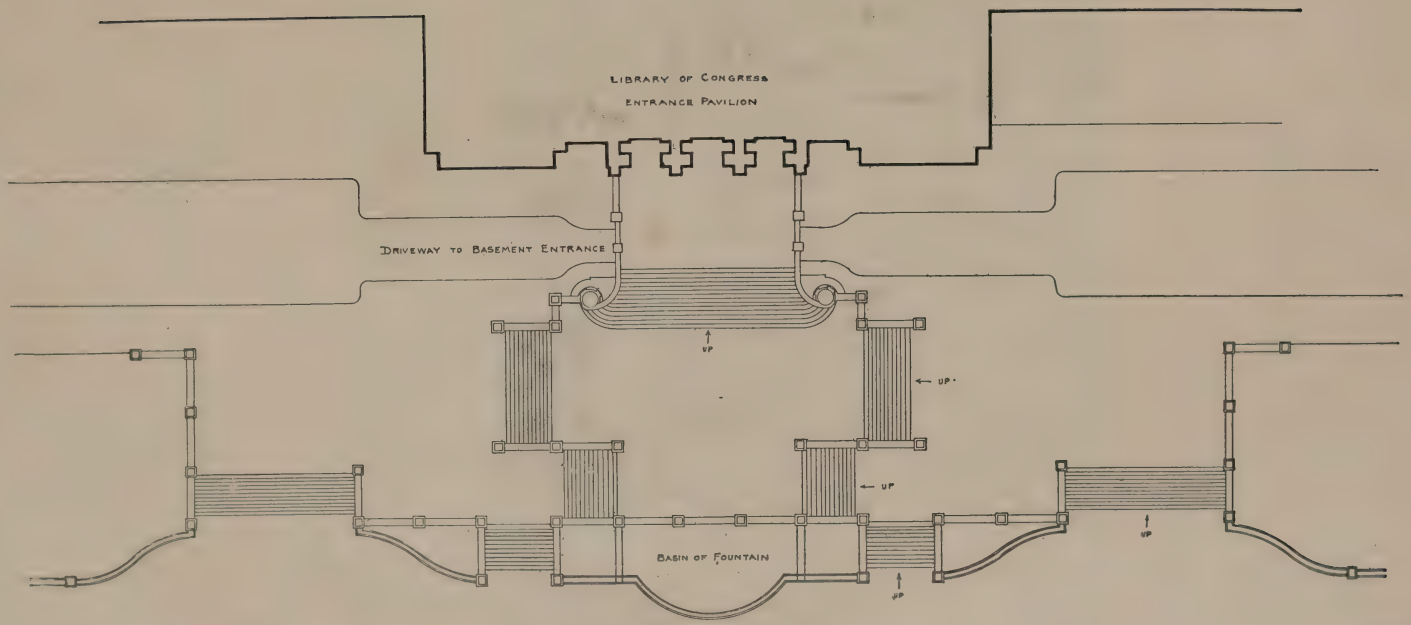


FIG. 4.

BOSTON PUBLIC LIBRARY

a subordinate system of stairs leads to the main stairhall, or it may be entered on the first story through three doorways which are filled by bronze doors of great beauty. The central door, the design of Mr. Macmonnies, has for the general subject of its decoration, the art of printing. The doors of the Northern Entrance are the design of the late Olin Warner, and embody the general idea of Tradition. The doors to the south were also designed by Mr. Warner, but, being unfinished at the time of his death, are in the hands of Mr.



FIG. 5.

Herbert Adams for completion, and are not yet (May, 1897) in place. Passing through either of these doorways, the visitor enters a large vestibule, the decorations of which he hardly notices because of the flood of light which fills the great stair-hall beyond, and because of the elaborate adornments of that hall. Figure 7 shows what the visitor finds in front of him—namely, a view from the center of the main vestibule at the more northern of the two flights of stairs, and some little of the sculptured decoration of the vestibule itself. The figures which adorn the great consoles carrying the girders of the ceiling are modelled by Mr. Herbert Adams. There are two different figures which are repeated in pairs throughout the vestibule. The architectural forms here are not very refined, nor is the general effect very impressive. It will be best, perhaps, to turn away from the great staircase and follow the vestibule itself toward the north;

turning, then, into the more northerly of the two side vestibules which we may as well at once call the Northern Vestibule. Figure 8 represents this vestibule and introduces us at once to the richer adornments of the building. At this point the visitor begins to realize the important fact that he is within the most ornate and, moreover, the most interesting building in the United States. If he is familiar with the monumental structures of Europe he finds himself, now, not unpleasantly reminded of them, and yet what is



FIG. 6.

around him is in no respect a close copy of anything which he remembers abroad. Details, indeed, may be of the well-worn patterns, and the curved arabesques of certain panels as well as the set patterns in parts of the mosaic may seem to him old acquaintances; but the general scheme of adornment is like nothing that he has seen elsewhere. In this Northern Vestibule, for instance, the system of decoration by means of paintings in lunettes above walls faced with marble, treated architecturally with some richness, beneath mosaic-covered vaults, is like nothing elsewhere, simple as the general



FIG. 7.

programme may be. The paintings of the lunettes are by Mr. Charles Sprague Pearce. The vaults above them, which, it is satisfactory to know, are the solid vaults which they appear to be and not plaster shams, are covered with mosaic carried out by Mr. Herman T. Schladermundt, under the general direction of Mr. Casey, and the floors are also laid in mosaic of simple design. The marble work of the walls is all apparently from the designs of Mr. Paul J. Pelz. It has been thought by some persons that the paintings suffer from the strong contrast of color given by the mosaics of the vaults. That is not the impression made upon the present writer; nor was it felt as more than a momentary suspicion by anyone with whom he has discussed the subject in the presence of the paintings themselves. It is not to be forgotten how very powerful is the delicate gradation of representative and expressional painting as compared with the coarser and more abrupt contrasts of color patterns of any sort. Even as, in the exterior of the Palazzo Vecchio, at Florence, the very slender lines of moulding prevail over the bold and rough rustications around them, so a small piece of highly-fin-

ished painting, as of flesh, drapery and landscape, will carry it over almost anything in the way of set patterns in flat or nearly flat color. It will be an extremely valuable experience if a semi-translucent coat of light gray could be passed over the mosaics of one or two of these vaults that we might see whether the paintings would be more perfectly set off by such a diminished intensity of the color

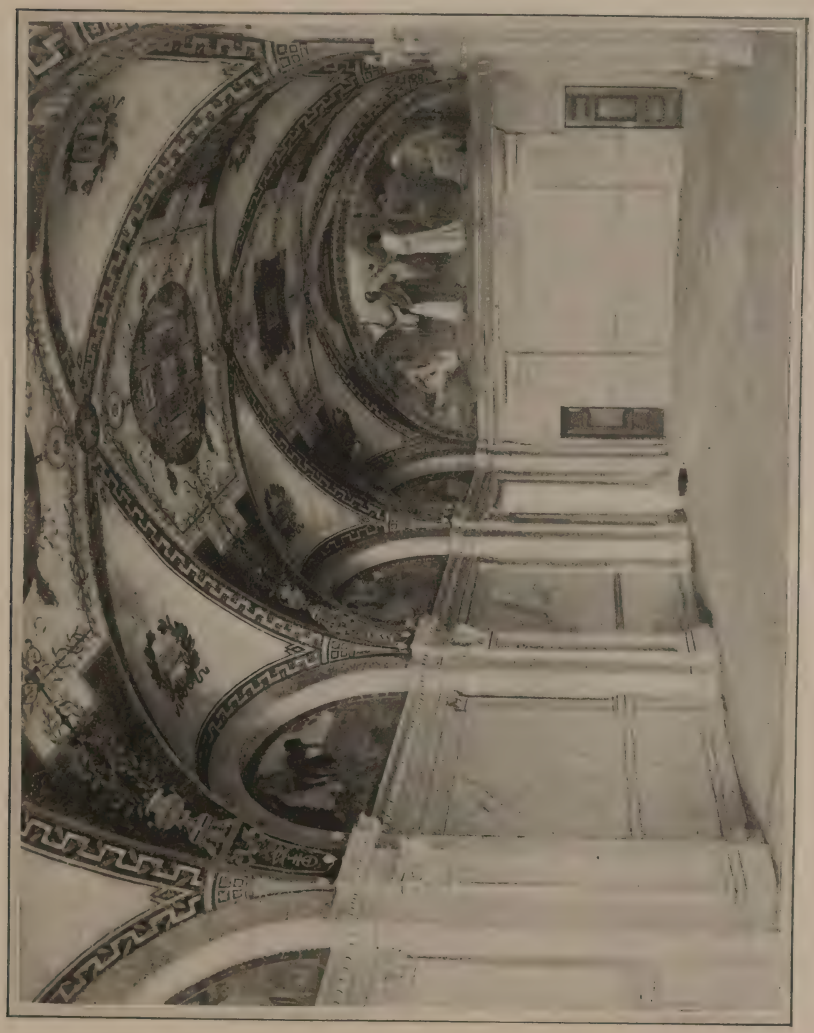


FIG. 8.

system of the mosaic. It is probable that we should see this tinting washed off with satisfaction. As for the paintings themselves, what they have for a general subject is "The Family," and the painting in the large lunette, plainly shown in Figure 8, speaks of the end of the day and the season of repose. On the left of the spectator the

lunettes which are visible represent Labor, Study, and, in the corner, Recreation. The lunette of which only a small piece is visible, on the extreme left, is the one which is most admired by visitors; its special subject is Religion or Worship. These paintings are, it may be noted, in an artistic sense, about midway between the highly conventional and severely restrained compositions of Mr. Vedder and the much freer and more pictorial work of Mr. Alexander and others. In fact, these pictures by Mr. Pearce are very typical of



FIG. 9.

the general character of the mural paintings throughout the building; and, as a consequence, this Northern Vestibule stands well for all of the interior except the great staircase hall.

Passing through the doorway, which shows so brilliantly lighted beneath the lunette "Recreation," one enters the corridor of the West North Curtain; to take the words of the lettering on the plans. The lunettes of this corridor are painted by Mr. Edward Simmons. Their subject is the Nine Muses; and the one plainly visible in Figure 9, at the end of the corridor, is Calliope. It is greatly to be

regretted that we can offer no other and no better view of these interesting pictures. The peculiarity of their composition is, the dominating position held by one large, seated figure; heavily draped and posed in a stately way, while the accessories are severely subordinated. The pictures suffer from the much too pronounced details and



FIG. 10.

the extremely harsh painting and gilding in the vaults above them where a peculiarly disagreeable orange-colored gold is very freely used. The rooms opening out of this corridor are not important in their decoration.

Returning to the main vestibule and passing through it southward, the visitor enters what we will call the Southern Vestibule,

which is represented in Figure 10. The conditions of this part of the building are in all respects similar to those which govern the Northern Vestibule. The paintings in the lunettes are by Mr. H. O. Walker; his general subject is Lyric Poetry, and this general subject is treated in the largest lunette — the one opposite the spectator in Figure 10. The pictures which are unseen in this illustration, but which fill the lunettes on the right or south side, are of such compositions as The Boy of Winander, for Wordsworth; The Dead Adonis, for Shakespeare, and the like. On the left of the illustration are seen the arches which lead to the Main Vestibule—to the southern ramp of the main staircase — and beyond to the stairs leading to the basement story. The reader will observe how, throughout this first story, in all the large vestibules and corridors, there obtains one uniform system of marble-faced walls and piers of the same or nearly the same height, about 12 feet, with vaults springing directly from the level cornice which finishes the wall. This uniformity of treatment greatly enhances the general effect. The Southern Vestibule, in which we are now standing, is one bay longer than the northern one, as the plan will explain. Turning out of it to the right, one enters the long corridor of the West South Curtain, Figure 11. The paintings here are as much bullied by the harsh gilding and the generally unrefined character of the decorations overhead, as are those of Mr. Simmons described above. These pictures are by Mr. Walter McEwen and their general subject is the Greek Heroes. In Figure 11, the lunette at the end of the passage is that of Hercules, and that on the right of the spectator, Jason, who is represented as persuading the young men of the Minyae to sail with him in the Argo. The door at the end of the corridor, beneath "the Hercules lunette," enters a richly-adorned



FIG. 11.

lobby which leads to the Senate Reading-Room. The doors on the right lead to the House Reading-Room, which is the subject of the next illustration, Figure 12. It is not very successful as a piece of combined decoration. The carved tympanums of the doorways are, indeed, very beautiful work by Mr. Herbert Adams; but these hardly affect the general tone of the adornments, in which, of course, color has by far the most important place; for strong color, when



FIG. 12.

present, necessarily predominates and determines the character of the apartment. It seems to have been thought that our representatives in Congress would prefer a room decorated in what used to be called the "steamboat" style; as, indeed, the general character of the room is violent and unrestful. The mantel-piece, at the end of the room, and the corresponding one which forms the subject of Figure 13, are unfortunate in their surroundings. They should receive especial attention. The mosaics which fill the large panels are from the designs of Mr. Frederic Dielman.

Returning through the corridor shown in Figure 11, and crossing the Southern Vestibule, one enters the Eastern Vestibule by crossing a corner of the main stair-hall. This Eastern Vestibule is the subject of Figure 14. The lunettes here are painted by Mr. John W. Alexander, and the general subject is the Evolution of the Book, or, perhaps, the evolution of literature. The lunettes seen in the



FIG. 13.

illustration are the two final ones of the series, having for their special subjects the MS. Book with the Monks at work in the scriptorium and the Printed Book with the master printer looking at proof while the journeyman pulls hard at the lever of the hand-press. The mosaics which adorn the vaults are, here, full of emblematic and allusive design upon which we cannot dwell. They are per-



FIG. 14.

haps not altogether as happy in effect as those in the Northern and Southern Vestibules; but this is partly caused by the less graceful form of the Vault itself, which is much wider and flatter, and in which the penetrations of the lunettes are less agreeably proportioned to the main cylinder. The archways on the right, in Fig. 14, lead to a secondary and narrow vestibule beyond which is a still smaller lobby adorned by admirable paintings of Mr. Elihu Vedder. On the right of the spectator, one of the Vedder lunettes is dimly seen, in deep shadow. It is through this lobby and be-

neath the largest of the Vedder lunettes that one enters the great reading-room. Figure 15 gives the interior of the reading-room looking southward. On the right is, not seen in the illustration, the principal entrance; the only entrance for visitors and students. The great piers, eight in number, which carry the vaulting, are of Numidian marble for the greater part of their height, resting on high dados



FIG. 15.

and pedestals of Tennessee marble; the color of this latter is dark purple, and that of the columns and pilasters, up to the capital, is a peculiar reddish brown; the capitals themselves being gilded. Money-saving contrivances are rather freely used here; the marble facing which we have described is but a facing to piers of solid brickwork, and the capitals are of plaster. In like manner, above,

the wagon vaults over the lunettes, the pendentives of the dome, and the great dome itself are all plaster simulacre. No doubt it is all strong enough and will endure, but any admiration one may feel for it is such admiration as clever scene-painting calls for. Architecture, in the highest sense, it is not. As a decorative design it is, however, fortunate. The great columns fills the re-entrant angle

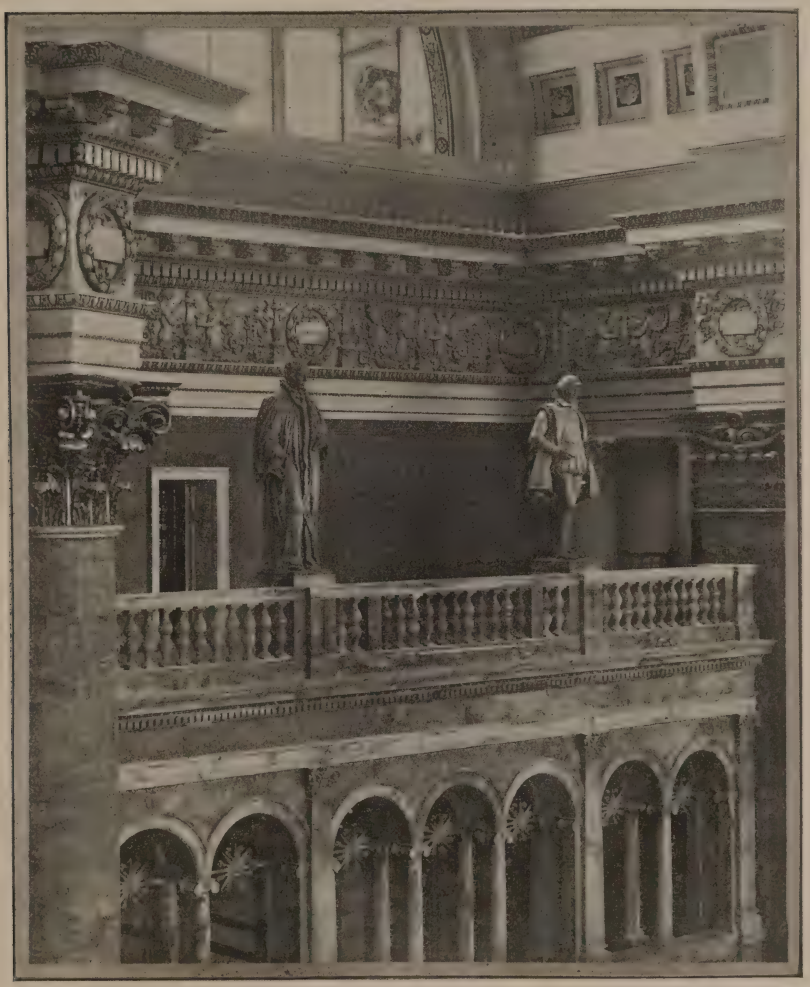


FIG. 16.

cleverly, and the proportions of the great piers to the vaulting remind one pleasantly of the best eighteenth century designing. The screens between the great piers are of yellow Siena marble, and it is recognized that there is in the design of these a rather violent transition from the severe Roman arcade of the lower row to the fanciful Renaissance arcade of seven arches above. By means of this change

in the system, however, the statues on the pedestals of the parapet are brought to their right places; they are well spaced with regard to one another and to the great piers. These statues are badly placed to be seen from the floor of the reading-room, for they are seen against a dark background of solid wall, while, immediately above them, there are the great lunettes filled with clear glass through

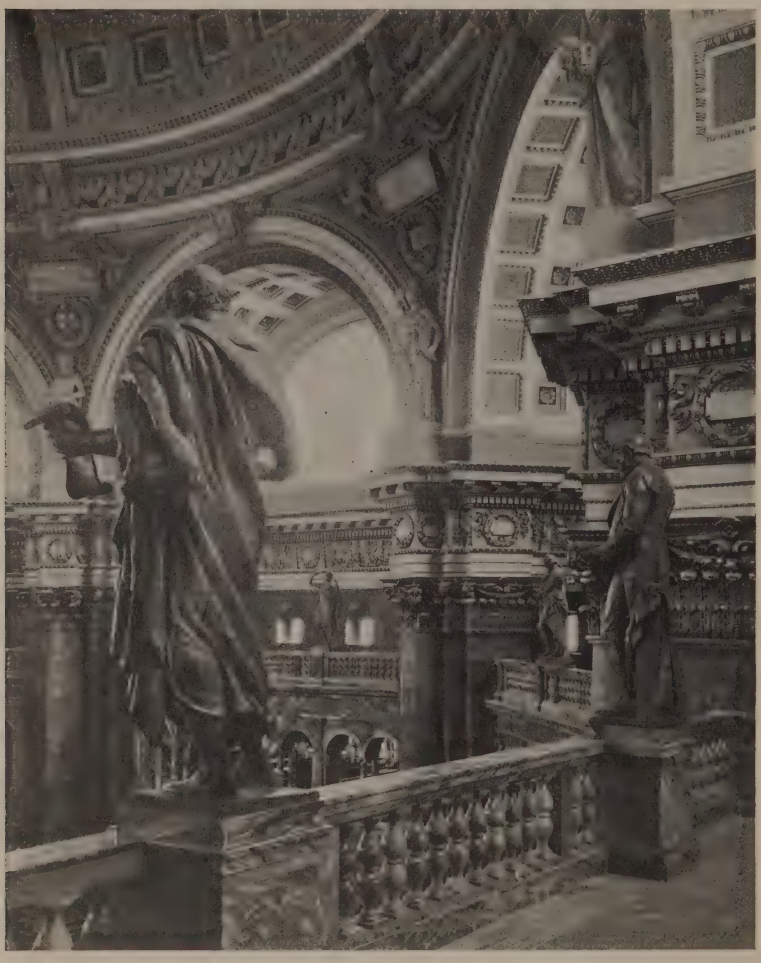


FIG. 17.

which there pours a flood of light which dazzles the spectator. There are symbolical figures above the entablature of the great piers; these are also of plaster, but they are none the worse for that. It is announced that they will be cast in bronze or cut in marble when Congress allows of that additional outlay; and to put them into the more costly and more enduring material will be to do them deserved honor. Yet, as long as the broad entablature above, with its elab-

orate floral sculpture, its cartouches and their supporters continue to be of plaster, and while the same less expensive material is used for the decorative figures in the pendentives and the very elaborate entablature below at the springing of the lunette-arches, so long the architectural display does not require the change from plaster to bronze. Let it be clearly understood that nine-tenths of the im-



FIG. 18.

portant sculpture which the modern world produces is exhibited for the first time in plaster, is judged by fellow artists and by the public while still in the plaster; that, in short, sculpture is a matter of pure form, indifferent to the material in which that form is embodied. Never let us despise plaster, or stucco, or gesso, or chunam, or gatch; these easily-managed and inexpensive materials are the most convenient things in the world, and without them the plastic

arts could hardly be practiced. It is only when they are used to cover up a cage of wood or iron while their surface is moulded into forms which are those of continuous, solid masonry, that these materials can, even for a moment, seem contemptible. As for the symbolical figures themselves they are of singular importance individually and in conjunction with the general design; but there is crying need of their being advanced into the rotunda and being thus freed from their much too close contact with the spandrels and the archivolts behind. It must be observed that each spandrel is also a pendentive, and, therefore, has a surface which rounds inward as it rises, and seems to force the head of the statue away from its proper pose. The broad top of the cornice at that point would allow



FIG. 19.

these statues to be set two feet further toward the centre of the dome, and that is what is important.

The connection of these symbolical statues with the bronze portraits and ideal portraits below them on either side, must be noted. Illustration Figure 16 shows two of the bronze portrait statues, the Shakespeare, by Mr. Frederick Macmonnies, and Chancellor Kent, by Mr. George Bissell. These two statues, however, are not a group, but each one of them forms, with the symbolical statue nearest to it and the bronze portrait on the other side of that, a group of three figures with special significance. Thus, Figure 15 shows, high on the left, the symbolical figure of Law, by Mr. Paul Bartlett, and shows below, to the left, the Solon, by Mr. Ruckstuhl, and a little to the right, the Kent, named above. The vacant pedestal seen above the great pier on the right in Figure 15, has since received the statue of Poetry, by Mr. J. Q. A. Ward, and the flanking bronzes of this group are the Shakespeare already named and the

Homer, by Mr. Louis St. Gaudens. So, in Figure 17, there is seen in the distance the symbolical figure of History, the work of Mr. Daniel C. French; and, flanking this, the bronze statue of Herodotus, also by Mr. French, and Gibbon, by Mr. Charles H. Niehaus. The two bronze figures in the foreground are, on the right, Robert



FIG. 20.

Fulton, by Mr. Edward C. Potter, which statue is one of the supporters of the symbolical figure Commerce; and Plato, by Mr. John J. Boyle, one of the supporters of Philosophy.

The dome is an unsatisfactory design, as seen from within, paneled with caissons too small and too strongly marked in form and color; a restless, rather than a dignified composition. It is covered thick with arabesques, which are, as nearly as possible, thrown away. This dome culminates in one of the noblest pieces of mural decoration of modern times; the paintings of the so-called Collar, which is a nearly flat band twelve feet wide. This has been adorned by Mr. Edwin H. Blashfield with a really superb composition of seated allegorical figures. As it stands this great design does not tell forcibly upon the decorative effect of the rotunda. Even in connection with the very beautiful painting which fills the circle above—the circle which forms the ceiling of the lantern and is a keystone to the composition below—these paintings do not affect the interior. Whether a simpler and, therefore, a better conventional decoration of the dome below would help this, it is hard to say. As it now is there is only to record the presence of a very fine piece of decorative painting which, its scale, its distance from the eye, its lightness, and its surroundings will not allow to do its full work of decoration.

Leaving the rotunda one comes out into the Eastern vestibule and into the main stair-hall. Figure 18 gives the view which the

visitor has as he turns to look back at the entrance to the reading-room. The richly-adorned archway which is called "the commemorative arch" has on its attic, which forms the parapet for the upper floor, a long inscription recording the names of the directors of the building and the dates. The sculptures in the spandrels of the arch are those important reliefs by the late Olin L. Warner, "The Students," which were exhibited in the plaster at the Architectural League Exhibition two or three years ago. Beneath this arch is seen a part of that elaborate mosaic ceiling of the Eastern vestibule, and beyond this again, the largest of Mr. Vedder's lunettes, "Government," the central idea. And now, one hesitates whether to leave unnoticed, for the moment, the varied and really magnificent display of decorative art in the great staircase hall, and to go on, upstairs, to the galleries and pavilions of the second story. It is an anomaly which, however, one accepts, that this great hall of entrance and ascent is the most ornate part of the building, and also contains the largest superficial area of any single pavilion; more even than the great octagon of the reading-room. It is also full of ornamental art of many different kinds, and it seems better to finish our account of the building by noting its artistic contents as we finally descend the stairs. If, therefore, we take the northern flight of stairs and reach the second story (see Figure 2), we may at once enter the West North Gallery. This large room, lighted by windows on either side, is almost exactly like the one shown in our Figure 20. The main difference between the West North Gallery and the West South Gallery shown in Figure 20 is this, that the paintings in the broad lunettes in the more northerly of the two halls are by Mr. Gari Melchers, and represent War and Peace. Passing through this gallery, then, we enter the North West Pavilion, which is decorated by Mr. William de Leftwich Dodge with four great tympanums and with that very important circular painting in the ceiling, which painting was exhibited not so very long ago, in the rooms of the American Art Association, on Madison Square. Fig. 19 shows one angle of this North West pavilion with parts of two of the lunettes, Music and Science; and between them the rondel in high relief, Winter, by Mr. Pratt, one of the same series of four which is repeated in all the pavilions. It can be partly seen from Figure 19 how very awkward is the architectural form given to these corner pavilions; but it cannot be seen how bad is the effect of the extremely low and flat cupola seeming to bear heavily upon the very inadequate pendatives where the Pratt rondels are, and seeming to crush the flat and low lunettes in which are Mr. Dodge's paintings. The reason given for the clumsiness of this design is the necessity supposed to exist of keeping the vault low, so that the attic story of each corner pavilion should be left

open and free as a separate room. It would have been a small sacrifice of space and of immeasurable value to the interior effect of the building had these corner pavilions been devoted, above the floor of their second story, to one well-proportioned and stately apartment, nearly fifty feet each way, and of about the same height.



FIG. 21.

Equally well if, indeed, it were essential to keep the attic room, the present height would have served all purposes of architectural effect, but, obviously, with a totally different system of design. Where would be the objection to a heavily-framed floor with girders and deeply-recessed panels between them? One immense advantage of such a floor, of which the underside should act as the roof of this great room, which have been the giving to Mr. Dodge—as in the other pavilions to his brother artists—parallelograms to cover with

his elaborate allegorical designs instead of the most ungainly lunettes which the present system has provided.

Returning now to the central stair-hall and crossing it towards the south, still on the second floor, the visitor enters the West South Gallery, shown in Figure 20. The paintings in the lunettes of this room are those important designs by Mr. Kenyon Cox, studies for which have been exhibited in New York. The subjects of the



FIG. 22.

paintings are The Arts and The Sciences, of which the latter is shown in Figure 20. Astronomy is seated high in the center, Mathematics and Physics are on the spectator's left, Botany and Zoology on the right. The gallery, itself, has not an important architectural character, having a painfully transparent sham of a plaster vault for its ceiling and extremely feeble treatment of the walls with a huddle of window-trims and pilasters, as if a scrap of solid wall would offend. The proportions of the room are not bad, but its effect depends chiefly upon the painted lunettes for its adorn-

ment. It is, therefore, the more to be regretted, perhaps, that the tone of color of the two paintings is disappointingly pale. The very noble and refined line-composition might have been clothed in warmer color, one thinks, with advantage to the pictures themselves and to the room which they complete. Figure 21 is one of the long museum halls in the curtains, this one being that which fills the



FIG. 23.

south curtain, and is nearly 220 feet in length. These rooms, with their skylights, are rational and well-fitted to their purpose; nor will the plaster cornices and coves look so unreasonably heavy when the cases, tables, etc., shall have been put in place. Perhaps there will always be the look of sagging in the middle which such a flat roof with skylights is apt to present. Much might be done with

these rooms with more carefully-considered coloring. Chromatic decoration is, with us, a secret known only to those masters who are also masters of descriptive and expressional painting. There are, indeed, several artist-painters who have not by nature that power



FIG. 24.

of artistic expression which a few of their abler comrades possess, but who have the color sense and are excellent in such painting of traditional ornament as our books of examples furnish. The designing of patterns—borders, scrolls and friezes—is, indeed, a lost art, but if one of those able colorists could be given a free hand in these cheerless galleries, these galleries might be greatly aided in their architectural effect.

The low door, on the left, in Figure 21, leads to the south stack, and the three doors at the end, lead directly into the South East Pavilion, in which the paintings are by Mr. R. L. Dodge and Mr. Garnsey. The South West Pavilion, behind us, in Figure 21, is decorated by Mr. George W. Maynard. There is still a fourth pa-

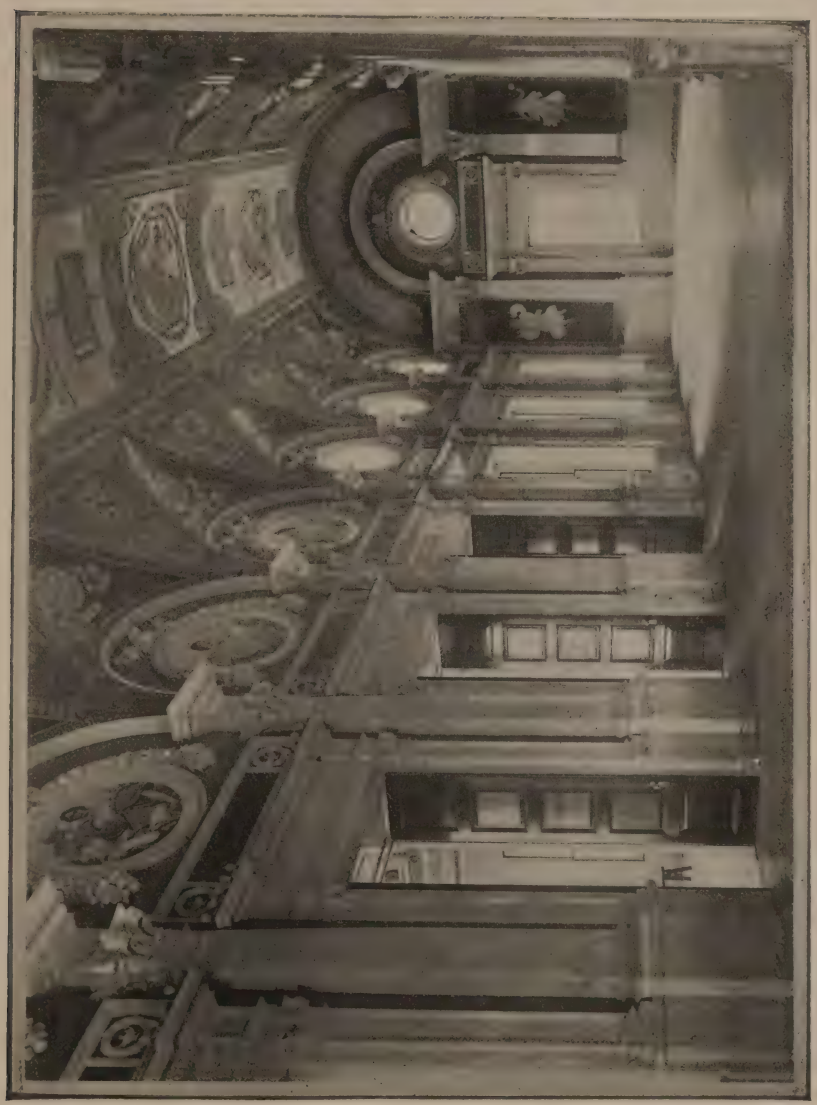


FIG. 25.

vilion on this floor—namely, that at the northeast angle of the building, which is called the Pavilion of the Seals, and is adorned with paintings which are more abstract and less descriptive than those in the other pavilions. The paintings are by Mr. W. B. Van Ingen and Mr. Elmer E. Garnsey.

If, now, we pass northward out of the West South Gallery where Mr. Cox's pictures are (see Figure 20), we enter the staircase hall by the three doors seen on the right in Figure 22. This part of the second story hall is called the South Stair-Gallery of the Entrance Pavilion. In Figure 22 the spectator is standing at the ex-



FIG. 26.

treme front, or western end of this broad corridor, and on his left is the well-hole of the great staircase. The vaulting over his head is no longer of masonry, but is mere form without substance. The walls, pilasters, columns, pedestals, and the rest of the architectural frame-work is either faced with or composed of grayish white veined marble, and the rounded surfaces of the ceiling are covered with

painting in vivid colors of such character as the sixteenth century artists of Italy made up from their study of Roman remains. If the spectator turns on his heel and looks northward, he has before him nearly the view given in Figure 23. The great corridor before him is the West Stair-Gallery, and the well-hole of the great staircase is on his right. The windows on the left look out toward the



FIG. 27.

Capitol and the round ones which fill the lunettes above are those in which are placed the portrait busts already spoken of in our description of the exterior. Again, if the spectator walks half way along this corridor towards the north, he will have, looking northeast, the view given in Figure 24. The reader is requested to study the plan at this point and to note the unusual disposition of the

coupled columns. A comparison of the plan with these three illustrations, 22, 23 and 24, will show how these pairs of columns are all set north and south, with the result that those pairs of columns which follow one another across the Entrance Pavilion from east to



FIG. 28.

west seem to have a very heavy wall to carry, while whatever wall may be carried on the coupled columns in the other rows can only be a thin one. It is not asserted that the actual construction of the pavilion requires this arrangement of very heavy cross walls marking the subordinate pavilions on the west front with thinner walls connecting; but it is evident that this is a perfectly conceivable system of construction, and that the result in the architectural

effect of the interior is most fortunate. This disposition of the pairs of columns gives singular vivacity and play to the perspective of the interior. It is rare that a modern using the Roman orders would consent to treat them so informally and make them his servants and helpers; his tools to work with instead of his unchangeable tradition.

Figure 25 is the North Stair-Gallery seen by one who looks eastward; the great doors on the left being those which lead to the West North Gallery, the one where Mr. Melcher's Peace and War lunettes are placed. Finally, to complete the circuit of the corridors on all sides of the great staircase, Figure 26 shows the East Stair-Gallery and the curious stairway which leads up to the balconies of the rotunda—namely, to those balconies which the spectator is standing in as he enjoys the views given in Figures 16 and 17. As regards the painted decorations of this second story of the staircase hall, with its elaborate system of seeming vaults, lunettes and panels of wall, it is to be noted that it is curiously strong and vivid in tone and yet with an almost wholly agreeable result. There is nothing more attractive than the unexpected pleasure which is to be found in this combination of vivid color with large surfaces of polished grayish-white marble. As seen from below (see Figure 18), or from the floor of the second story, as in all the Figures from 22 to 26, the general effect is equally agreeable, and surprisingly so. It is hardly worth while to describe the way in which the darker or cooler colors contrast with the warmer colors and the lighter ones because the photograph so often seems to contradict what one is saying, and is sure not to confirm it in any positive way. The painting in the North Stair-Gallery has been more or less modified by Mr. Robert Reid, who is the author of the paintings in the rondels seen in Figure 25, and also of the octagonal panels in the roof, faintly seen in the same illustration. In like manner, the painting in the South Stair-Gallery, conforms more or less to the system adopted by Mr. Frank W. Benson, who is the author of the rondels shown in Figure 22, and of the octagons in the ceilings. Mr. Walter Shirlaw has painted the upright panels with large figures in them, which are seen in Figure 23, between the lunettes on the left; and in Figure 26, the large panels in a corresponding situation, are the work of Mr. John R. Barse, Jr. The wall panels everywhere in this series of corridors are the work of Mr. George W. Maynard, the figures being relieved on a ground of Pompeian red. It has been said that the taste of each of these artists has somewhat modified the coloring in the corridor which he has worked upon, but it remains true that the system of color decoration has been held in hand, and that we are compelled to put the names of Mr. Garnsey, the general director of color decoration, and of Mr. Casey, the architect, as general authors of the whole system of adornment so suc-

cessfully carried out. It is, indeed, somewhat abnormal that these really superb corridors should be put there for their own sake, apparently. Indeed, they seem to exist for their own sake, so much more lofty and more important do they seem than the galleries to which they lead, and so wholly without utility is the Western Stair-



FIG. 29.

Gallery for its whole length of about 130 feet, stretching from north to south of the Entrance Pavilion. It is not, however, without a higher use in so far as this great combination of halls in two stories with elaborate staircases to connect them will always be open to visitors even when the work of the Library partly shuts off the other rooms of the building from free public access; and in so far as this rich adornment will exercise a beneficial popular effect.

Leaning over the parapet of the South Stair-Gallery and looking

northwesterly, we look down upon the northerly stair, as in Figure 27. The tall bronze figure, serving as a lamp-stand and set upon the newel of this stair, is the work of Mr. Philip Martiny. The arches to the left of that figure and newel lead to the Main Vestibule and out of doors; those to the right open into the Northern Vestibule, where are the paintings by Mr. Pearce. The very elaborate adornment of the staircase with child-figures and festoons, as well as the group of two putti with a globe above the niche, are all the work of Mr. Martiny. The very interesting arrangement of the newel, with the handrail carried around it, probably, the design of Mr. Pelz, and it is, perhaps, to that artist that the general disposition of the stairs is to be accredited. In Figure 27 are also to be seen, in the second story, the doors leading into the West North Gallery, and a fragment of Mr. Gari Melcher's picture of War. Above these doors are seen also the circular pictures by Mr. Robert Reid. In Figure 28 is seen the newel and lamp-holder of the south stair and the Martiny figures of the hand-rail and central composition of this stair, corresponding closely with those of the northern one, seen in Figure 27. The group of two children in Figure 27 stands for Europe and Asia, that in Figure 28 for Africa and America; but their meaning is obviously of less importance than their effect as pieces of decorative architecture. At the extreme right under the arch is seen a little of the Main Vestibule with a single one of Mr. Herbert Adams' console figures. Finally, in Figure 29, there is given the view which any one will have who, standing on the first floor in the Southern Vestibule looks northerly across the lowermost platforms of both staircases toward that wall of the Northern Vestibule where Mr. Pearce's lunette of Labor is plainly visible. The visitor who takes this last look at the decorative interior which he is about to leave may well retain it in his mind as characteristic of the whole effect of the stairway hall and its dependencies.

The above is an inadequate description of a building which has been completed for somewhat less than the appropriation; which has been built without large general contracts; the details of which have been designed from time to time as the building progressed; the richer sculpturesque adornments of which have been created partly by a sculptor permanently employed and partly by distinguished men engaged for the separate pieces of work; the color decoration of which has been managed throughout in the same way; all the artistical details having been brought into being without haste and as they were found suitable. To say that the building in all its parts might have been still better had it been guided from the commencement by a supervisor as competent and as resolute, in the artistic direction, as has been, clearly, its administration in the way of materials and construction, is to say that the community ought to be

more civilized. "We're crude in some things here," in the words of one of the late parodies on Mr. Kipling, and with the author of that parody, the fact we much deplore. Obviously, the one thing in which we are the crudest is that of fine art, in cases which are not those of the single Paris-taught painter working in his studio and summoning up all tradition and all teaching to his aid—but fine art in great masses and on permanent exhibition, the work of many men agglomerated together in a great public building. The New Library of Congress is a model for our future proceedings, and the men who have organized it and carried it out, deserve the quite unbounded thanks of the whole community.

Russell Sturgis.



MARSEILLES—AN OLD VIEW OF THE OLD CATHEDRAL.

FRENCH CATHEDRALS. Part XIII.

THE MARITIME CATHEDRALS. II.

I.

THE visitor to Marseilles, even if he does no more than rapidly drive through the city, is sure to have his attention directed to the magnificent new cathedral, built directly on the Mediterranean, at the very sea-entrance to the busy port, a situation quite unique among the cathedrals of the world, and recalling, in a very splendid way, the ancient fashion of the maritime cathedrals, built directly on the sea. That superb edifice, the largest, if not the most costly modern church in France, is more likely to hold the eye than the misshapen, decaying fabric of the older cathedral of La Major, fast crumbling into ruins close beside it. And yet that decaying mass will enable the general traveller to obtain an excellent conception of the methods of the Romanesque of the far south, and afford the student not a little light on the construction of churches in Provence in the eleventh and twelfth centuries. But this is within: for the exterior exhibits nothing of interest, the somewhat monumentally designed entrance that formed the south façade, built in the seventeenth century, having been removed in the present, when a portion of the structure was taken down to make way for the new cathedral.

Like many of the churches in the south, the church of La Major derived its chief importance from its rank as the cathedral of Marseilles, and the traditions that centred around it. Once, it is supposed, it extended considerably to the west, but no definite record has been preserved of its ever having greatly exceeded the site of the present structure. It has the usual plan of a nave with aisles and three apses, those of the latter having long since been removed to



OLD AND NEW CATHEDRALS OF MARSEILLES.

make way for the present rectangular chapels, while the extension of the choir towards the west for ceremonial purposes makes the actual internal area seem much smaller than it really is. The central bay of the nave is covered with a dome whose construction distinctly recalls the dome of the cathedral of Avignon. A series of arches rising on the inner faces of the east and west arches which enclose the bay below, form a square. In the corner are small pendentives, with symbols of the Evangelists, supporting an octagonal dome, with flat ribs on the edges of the octagon. A modern window has been cut in



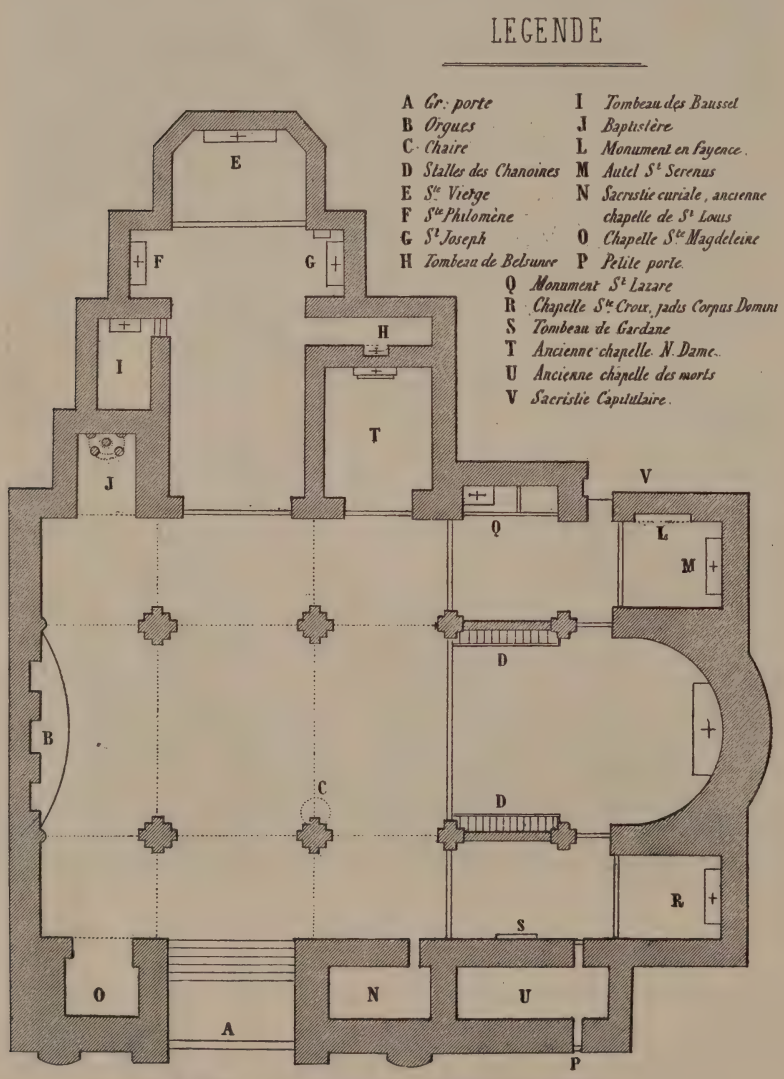
MARSEILLES CATHEDRAL—INTERIOR OF DOME.

the north and south faces. Strangely enough, this cupola was closed by a lower vault, built towards 1480, and not removed until 1704, when the original structure was uncovered to the very considerable astonishment of those who brought it to light. It is decorated with frescoes, now greatly defaced.

The semicircular apse, with its small rectangular bay, immediately before it, is also characteristic of the period of the church. Its vault is carried on large ribs, resting on corbels on the lower surface of the semi-dome. On the wall below is an arcade with square pilasters. Some old views of Marseilles (1567-1570, 1614, 1650 or 1660) show

a large semicircular tower surmounting the apse, but there is no record of its disappearance. Two square towers once flanked the church; the present tower, built before 1627, adjoins the face of one of these.

The cathedral now contains but one monument of general inter-



CATHEDRAL OF LA MAJOR, MARSEILLES—PLAN.

From Bousquet.

est, the charming fragment of the Renaissance, known as the chapel of S. Lazare, the head of that saint having been the chief treasure of the church until it was removed to the modern cathedral. The chapel is of white marble, and was built between 1475 and 1479, and entirely completed by 1481. The architect was Thomas de Como, and the

sculptor François Loreaba, a celebrated medaillear. It consists of two arches, supported on delicately carved pilasters at the extremities, with a similarly decorated column in the centre, which is said to have been taken from a temple of Diana, though its decoration is certainly not antique. Smaller pilasters above these, supporting the crowning frieze, have each a small statue on the face; in the centre is S. Victor; to the right, S. Lazare; to the left, S. Cannat. Over the freize, which is plain, is a richly carved semicircular pediment, one above each arch. Small statues stand on pedestals between them; at the extremities, a bishop, a father of the church; in the centre, Our Lady. Each pediment carries a statue on its apex, S. Mary Magdelene on one, and S. Martha on the other. It is said that these last two statues were formerly in the pendentives of the dome, and were only put in their present place in 1823 or 1824; but this statement does not appear to be wholly authenticated. The chapel is a shallow structure; nothing more, in fact, than the archways; but it is a really notable monument, and is the single object of artistic interest within the cathedral.

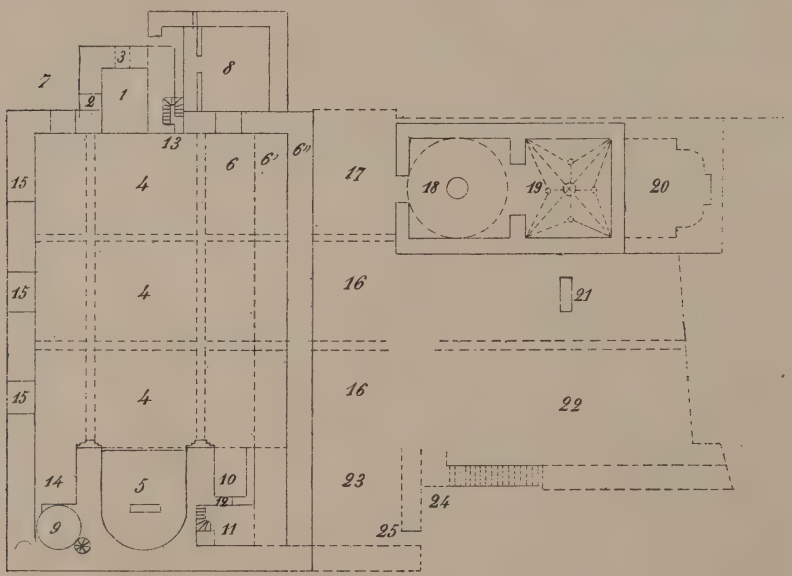
II.

The traveller who visits Toulon for the single purpose of seeing its cathedral is destined to encounter the bitterest disappointment of his journey in France. It is not the cathedral that attracts one in this bright, bustling, military seaport, but the active life of its streets, its massive fortifications, its harbor, its crowds of sailors and marines. War permeates its streets as it does its waters, and few French cities offer such gay street scenes or present so many aspects of modern life. The cathedral is one of the largest of the maritime churches, and it is also one of the most uninteresting. That means a good deal, for if a French cathedral is not of the highest interest, it is apt to be at the other extreme and touch the very lowest notch of insipidity. All through the south one is coming upon churches that require the earnestness of an enthusiast to excite interest in them; but the most indefatigable cathedral visitor quails before the heaviness of Toulon, its mixed piers, its indiscriminate arches, the poverty of its façade, the general artistic squalor that permeates the whole building.

Yet the history of the church is not devoid of interest. Originating, so far as some fragments of the present structure are concerned, as early as 1096 or thereabouts, it had the form, in the twelfth century, of the churches of that period—that is to say, a nave, two aisles, a semicircular apse, and a tower at the west end. Of the details of this structure so little has survived that it is impossible to determine its character. Succeeding centuries doubtless saw many alterations in its fabric, but almost the whole of the early church disappeared in

the changes begun in 1654, when the cathedral was largely added to on the north side. So great were these extensions that what had been the length of the church then became its breadth; the ancient choir became the chapel of S. Joseph and a new, high altar was erected towards the north, the orientation of the cathedral being completely reversed. The chapel of the Virgin that once stood free from the church, became an integral part of it.

The time at which these radical modifications were made was neither conducive to original work nor favorable to archaeological accuracy. The interior is, therefore, a singular jumble of columns and piers and arches, reproducing older forms in some instances,



SKETCH PLAN OF THE CATHEDRAL OF TOULON.
From Rossi.

4. Original nave.
5. Ancient site of apse and high altar.
16. Addition of 1653.
21. Place of high altar.

starting out with new motifs in others, and producing such a mixture that the spectator, lost in the labyrinth, wonders amazed that such things could be. The façade, built about 1696, is a heavy design in the taste of the time, with two stories of engaged columns supporting a pediment. It is not wanting in a certain dignity, and the traveller returns to it with a sense of satisfaction after the depression caused by the interior.

III.

One who would take satisfaction in the gay life of Toulon and the comfort of its modern hotels, would not be apt to visit Adge, save

for a day's outing from Béziers, whence one could make a delightful excursion. It seems impossible to believe that this sleepy little town was once a famous seaport, filled with an activity scarcely less than that which to-day distinguishes Toulon; yet such is the case, and the silent brown cathedral, rising just above the quay on the river, with its



AGDE CATHEDRAL—VIEW FROM THE SOUTHWEST.

solemn battlemented walls, and its donjon-like square tower, testifies to its former importance, as well as to the dangers that once beset its inhabitants. Here, at last, one meets with the maritime fortified cathedral of the twelfth century in its fully developed form, a church with strong, sturdy walls, buttressed without with a regular series of

plain arches carrying battlements, with openings behind the arches, from which the missiles might be projected upon too daring assailants; and the tower, so strong and severe in its building, with scarce an opening save directly within the machiolations at the top, as to seem rather part of a fortress than an integral feature of the House of God.



AGDE CATHEDRAL—INTERIOR.

The cathedral is a rectangular building, with a straight roof-line, seeming more a castle than a church, its pointed roof being hidden within the battlements. Its silhouette is both striking and fine. The tower presents a superb and impressive mass that groups admirably with the cathedral, small as it is. It needs only a clearing



AGDE CATHEDRAL—TOWER.

away of the buildings now against it to show its real and complete beauty. The modern traveller is fascinated by its novelty of aspect more than by its beauty, for that consists simply in the regularity of its design, its windows being scarcely more than slits in the wall, and its only external ornament, the piers that carry the arches on which the battlements rest. The entrance, which is close by the tower, is an unimportant addition of the last century.

Within, it is as simple as it is without, only here one has not the fascination of the sobriety of the exterior, nor the sense of dignity due to its massive form. It is a single chamber, without aisles, the interior consisting of a hall roofed with a pointed tunnel vault, the walls being marked off into bays by plain arches, six in number, carried on rectangular piers that, unfortunately, have been cut off below to make room for an unimportant wainscoting carried around below them. On the south side is a chapel, which is a portion of a cloister enclosed, and so much rebuilt as to be practically modern. Its exterior is decorated with arches, arranged in groups of three, surmounted by a battlement.

Bristling with war as this cathedral is, it is only a fragment of a former time that has survived in the midst of surroundings now wholly given over to peace. Adge is no longer a port of importance, but one of the smallest towns on the coast. The gentle smiling river, above which the cathedral raises its frowning walls in most startling contrast, would afford a site of almost unsurpassed beauty were it not for the ugly houses between it and the church. But a day at Adge will not be misspent, and here, at least, the architecture of the maritime cathedrals of France can be seen and studied, and enjoyed —though in the midst of somewhat primitive surroundings—in the full vigor of its maturity and in a most excellent state of preservation.

IV.

At Adge one sees the military cathedral of the coast in a well restored structure that retains the impress of its early utility in admirable form. The cathedral of Maguelone is another notable example of military architecture, but with so dismantled an exterior as to scarce seem more than a pile of ruins. Fortunately, its character can be clearly discerned, and the church has been so judicially restored within by M. Révoil that it is well worth a visit.

The adventurous traveller, intent upon varying his journey in as many ways as possible, may take the train from Montpellier to Palavas, a watering place of some local renown, and thence proceed to Maguelone by boat. For this strange cathedral is literally a church of the sea, being situated on a small tract of land almost wholly surrounded by the Mediterranean, and connected with the main land by a narrow strip. Once it was a very famous place, a port of renown, and here Urbain II. came on his way into France to attend the council of Clermont, at which the first Crusade was preached. So important was the town that the papal throne designated it as the Port of S. Peter, a distinction it retained for many centuries. Under Louis XIII., however, the entire town was swept away for military reasons, and everything save the cathedral destroyed. Its exposed position at all times is sufficient explanation for the intense military character of the architecture of the cathedral.

One may, indeed, still approach the cathedral by boat; but the more agreeable way will be to take a carriage from Montpellier and drive along one of those superb roads one meets everywhere in France. For half the distance the way is bordered on each side by a splendid row of lindens. But presently the landscape becomes somewhat bare, though the vineyards are continued on each side of the road almost to the very cathedral walls. The church is owned by the proprietor of these rich fields, Mr. Fabrège, who lives close beside it, the only individual owner of a real cathedral in France, whose life

has been consecrated to its restoration to worship and to the authorship of a monumental work on the history of Maguelone.

The carriage stops; and one wonders where the cathedral is; to the right is a high, rough wall, crumbling into ruins, supported by ruined buttresses, with the merest slits for windows. But there is nothing else in sight, save a couple of old buildings and a modern house that one speedily learns is inhabited by M. Fabrège. And, in fact, this ruined mass, this featureless pile, is the cathedral. The exterior defies description; yet even in its dismantled condition it clearly emphasizes its military origin. Its stout walls, lighted by narrow openings better suited to shoot arrows from at an intruder than admit daylight to a church, were built at a time when even this sacred struc-



MAGUELONE CATHEDRAL—SOUTH SIDE.

ture was exposed to the ravages of the infidel and the freebooter. The buttresses are not buttresses at all, but piers that once carried arches, similar to those that surround the walls of the cathedral of Adge, with openings behind their crowns from which missiles might be ejected upon an attacking party. Around on the west front there is the same evidence of decay, but the single pier in the centre of the façade retains fragments of the arches whose larger parts have long since fallen away. Here, also, is the base of a tower, a fortress in itself, with huge pier-like buttresses on the angles, that nearest the cathedral doorway being built out towards the top, doubtless to support a turret that, like the whole of the upper part, has disappeared.

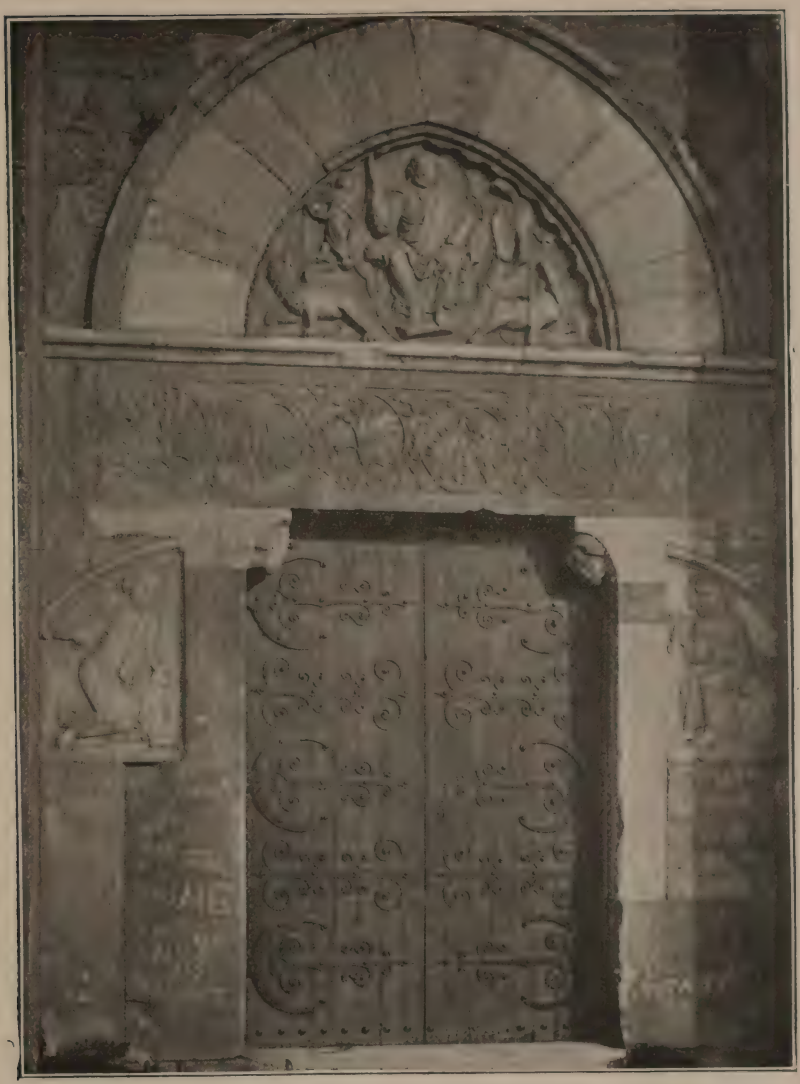
The portal, which occupies the centre of the west wall, is the single part of the exterior that retains any ornamental feature. A flat lintel, carved with a broad band of foliage in low relief, is supported by two piers which are simply the endings of the wall. Above is a pointed arch within which is a representation of Our Lord seated in judgment, with the symbols of the four Evangelists around Him. Below the lintel, and beyond the stones that form its support, are two reliefs, one representing S. Paul, with his sword; and the other S. Peter, with the keys; the cathedral being dedicated to the latter Apostle. They are crude reliefs, with heavy fat faces, as is that of the Christ above, and of a much ruder form of art than the splendid sculptures of S. Trophime at Arles and other works of the twelfth century in



MAGUELONE CATHEDRAL—WEST FRONT.

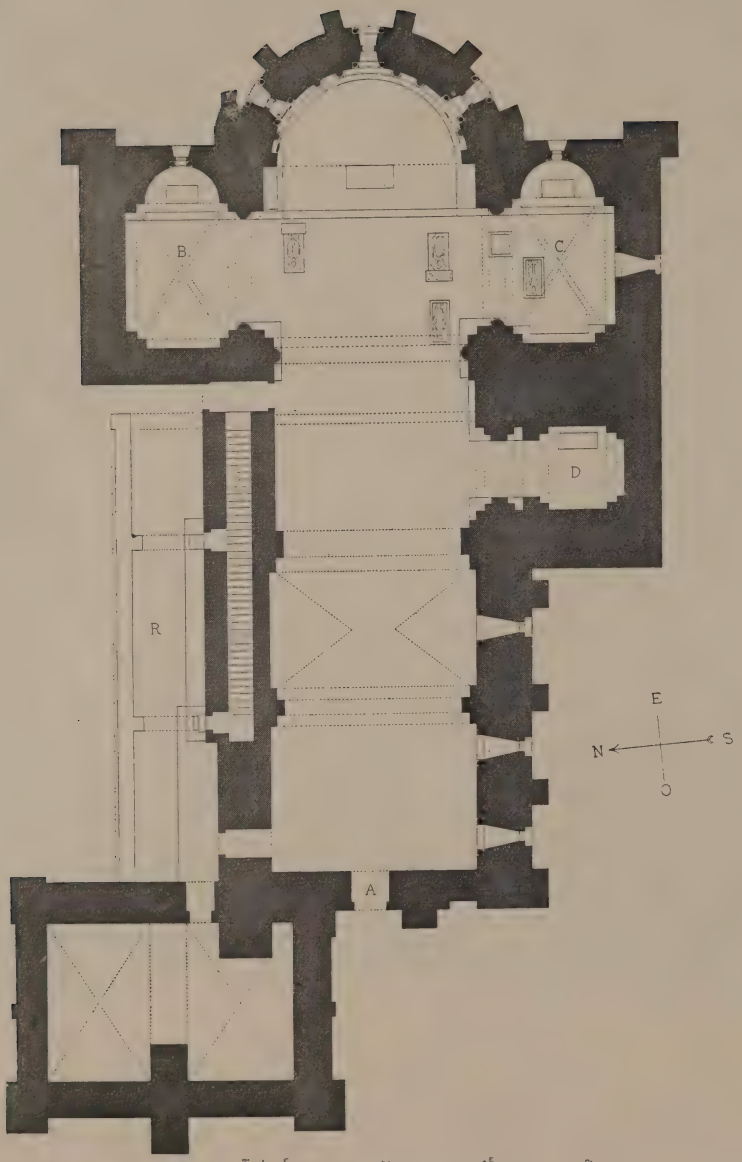
Provence. They unquestionably belong to an earlier period than the actual construction, which is probably due to bishop Jean de Montlaur (1158). The lintel bears the date DMCLXXVII.

Once within the church the amazement that covers one at its external construction gives way to satisfaction at the very admirable and careful manner in which it has been restored. It consists of a nave of four bays with a semicircular apse. On each side, opening out from the fourth bay in transept form, is a chapel, also with semicircular apses. That on the north was built by bishop Galtier, and is dedicated to the Holy Sepulchre; it was formerly surmounted by a tower, as was the corresponding chapel on the south side dedicated



MAGUELONE CATHEDRAL—WEST DOOR.

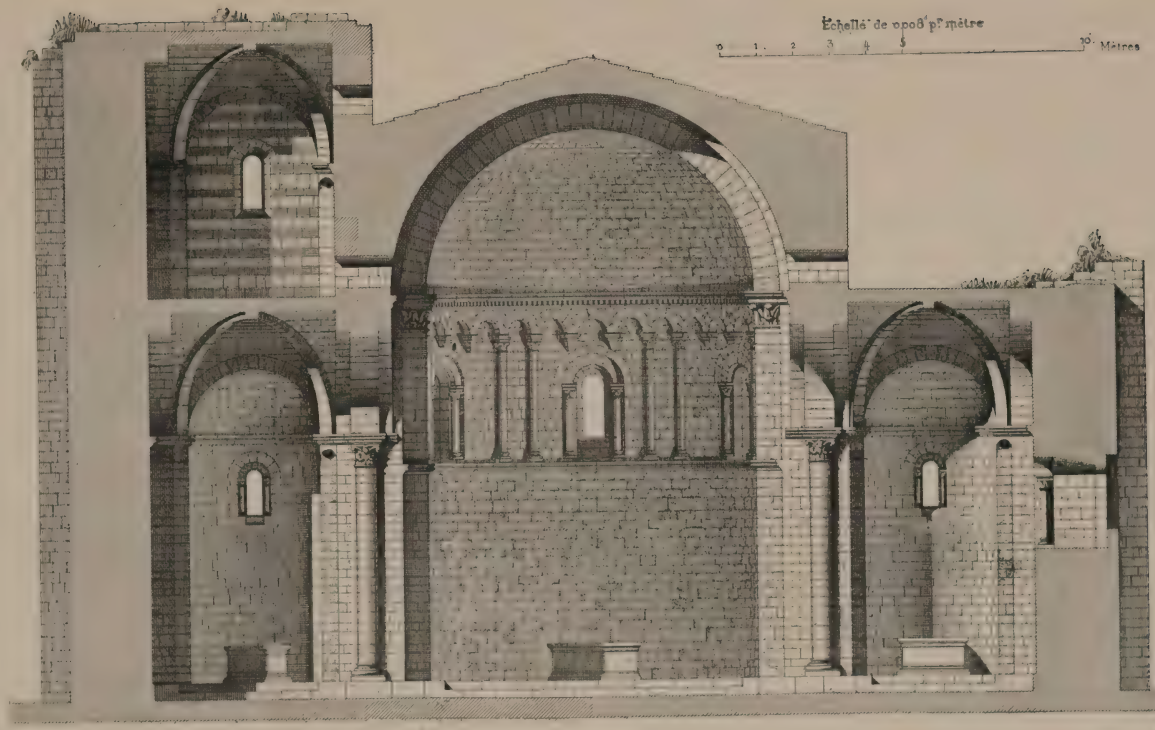
to S. Marie. In the chapel of the Holy Sepulchre the mausoleum of Cardinal Raymond de Canillac was built in 1373, and it still retains tombs of members of his family. Another chapel on the south side opens from the third bay, and is dedicated to S. Augustine. This chapel is in two stories, and on the north side, in the corresponding position, is another upper chapel. Both are connected with a tribune or gallery that fills the first two bays, making the church, in this part, a two-story edifice. This was the gallery of the canons, and enabled them to reach the church without mixing with the populace, by



MAGUELONE CATHEDRAL—PLAN.

From Révoil.

BOSTON PUBLIC LIBRARY



MAGUELONE CATHEDRAL—TRANSVERSE SECTION.

From Révoil.

means of the upper cloister that adjoined it, all of which has disappeared.

The successive stages whereby the cathedral was added to towards the east have been indicated in the restoration by placing outlines of the former dimensions—real or supposed—on the floor. At the beginning of the third bay is indicated the outline of the cathedral built in the eighth century by Charles Martel, who took the city from the Saracens after a notable seige. At the beginning of the fourth bay is the outline of the church built by bishop Arnaud (1030-1060). The work of the latter prelate was continued and completed by bishop Godefrid (1080-1104) whose immediate successor Galtier repaired the apse, built the tower of the chapel of the Holy Sepulchre, and added a number of important conventual buildings to the cathedral group. Later on in this century other repairs were made by bishop Jean de Montlauer. The cathedral was dedicated in 1054.

There is little carved ornament in the interior. The windows are too small to require architectural frames, and the numerous squints, intended for defence, are rather irregularly placed on the south or water side and at the west end, and, like the windows, require no architectural treatment. The capitals of the piers and columns are plainly moulded, or of the usual Romanesque type, slightly carved with foliage. The interior wall of the apse contains the chief decorative feature of the interior, consisting of roll mouldings and columns at the three round-topped windows which light it. Below is an arcade of round arches, some of which are carried on columns, while others are supported by corbels. Several of the columns have been replaced by modern ones in the restoration.

In visiting the cathedrals of France one may, if one is so disposed, do much climbing of towers and roofs, but nowhere are the results of such exertion more amply repaid or more overpowering in their effect than at Maguelone. A dismal flight of steps built in the north wall of the cathedral, on the side where once the conventual buildings stood, admits one to the roof. The spectacle presented from this point of vantage borders upon the sublime. You are now at the extreme south of France, at the very entrance to the country, the port to which many a pope came on their tours above the Alps, a city famous in the development of the south. Behind you is the immeasurable blue of the Mediterranean, extending indefinitely into the background. And before you is the whole of France. On very clear days it is possible, from this roof, to distinguish the most westerly of the Alps on the one hand, and the most easterly of the Pyrénées on the other. The whole landscape is dotted with peaks famous in French history, but whose names and significance to the American are too often meaningless and unknown. But there before you is France, fair beautiful France, with its smiling vineyards,

its innumerable cities and towns, its history, its life. And it is a suggestive fact that of all the cathedrals of that wonderful country the one you are standing on is the only one that was a fief of the Holy See, and the only one suffered to fall into ruin, to be profaned and alienated from its sacred purpose, until restored to art and to worship by its present scholarly owner. The popes who began their visitations to France at Maguelone adopted a significant and picturesque route that the modern traveller, with all his manifold advantages, never enjoys.

The cathedral of Maguelone began to decay as early as 1536, when the bishops transferred themselves to the more flourishing city of Montpellier, using their former cathedral chiefly as a place of burial. The town was finally wiped out of existence by Louis XIII., though in its early history it was a place of great importance. Military stronghold as it once was, it is not a little striking that a walled city and a cathedral of some size should have risen in this place, far from the source of building material, and in a locality absolutely devoid of constructive appliances. Even as it stands to-day, the cathedral is an impressive illustration of the energy and faith of a time never baffled in undertakings in religious architecture by difficulties of site or remoteness of situation.

V.

The cathedral of Elne will conclude this survey of the maritime cathedrals of France. We are now on the extreme west side of the Mediterranean, not more than an hour or so from the Spanish frontier. Built in the middle of the eleventh century—it was in process of construction in 1042, and an altar was dedicated in it in 1069—the cathedral illustrates the architecture of the period, while its situation is sufficiently close to the sea to make its military character if not necessary at least due to some apparent reason. Like most of the southern cathedrals its exterior is almost devoid of features. Its walls show many signs of rebuilding and restorations, and they are utterly wanting in carved or ornamental features. There are no piers and high arches surrounding the walls as at Adge and Maguelone, but the west wall is surmounted by battlements, a feature reproduced in the crowning member of the south tower. This tower is, in truth, the only external portion of moment. It is a graceful rectangular structure, whose surface is treated in stories of round-arched arcades, separated by plain strings, the central arches of the two upper stages forming windows. It is an example of the Catalonian type of military tower, a place of refuge in danger, rather than a religious ornament. It was repaired when the cathedral was fortified by bishop Udalguer in 1140, and again in 1415, when it was



ELNE CATHEDRAL—WEST FRONT.

strengthened at the base, owing to disintegrations that had appeared in its structure. The north tower was never completed, but is surmounted by an inconsequential structure in brick. Neither tower is directly aligned with the centre of the façade nor with the lateral walls.

This unimportant exterior encloses a church of great interest. The cathedral has a nave of seven bays, with aisles, all three with an apse On the south side is a series of chapels, six in number, the tower at the southwest extremity filling the space of the seventh chapel. The first two bays of the nave are filled with a tribune, supported on cross vaults; the nave has a round tunnel vault carried on single arches that rest on engaged columns applied to the main piers, or on rectangular portions of these piers. All of the supporting members have been cut away in their lower part. The vault of the north aisle is a quarter circle in form, supported on semicircular arches that, on one side, rest on the portion of the pier separating the aisle from the nave, while on the other they are applied directly to the north wall, each bay, except the first, having a round arch cut in the outer wall.



ELNE CATHEDRAL—INTERIOR.

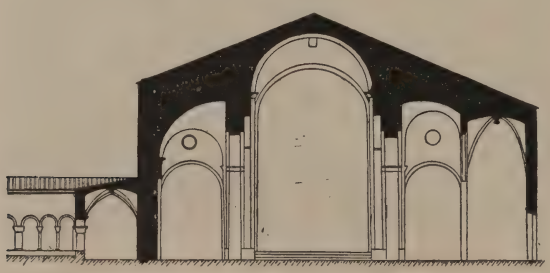
In the south aisle, which is narrower than the northern one, the vault is the same, except in the first three bays, where, owing to the height of the chapel vaults, it has been rebuilt as a segment.

The chapels offer little of interest. The most easterly one was built towards the end of the thirteenth century; the next one, to the west, dedicated to S. Augustine, between 1327 and 1341. The three westerly ones were added towards 1441 and 1448. At the west end of the north aisle is a small dark chapel, without windows, but now lighted by a small skylight cut in a section of the cross-vault. It is one of the lugubrious sanctuaries, extremely popular in the region, where the religious conception has a tinge of solemnity in striking contrast with the ardent nature of the people. A chapel that approximated a tomb had, for them, a realism that gave them the utmost satisfaction. The apses of the nave and aisles are unimportant, and have been, at one time or another, a good deal restored and changed; they are wholly devoid of architectural treatment.

The windows of the church are small and unimportant, several of them having been walled up, and the interior is, in consequence,

somewhat dark. It is not, however, wanting in that quiet dignity that all southern churches have, due to the sobriety of their structure. The proportions of the interior, moreover, are rather happy, both nave and aisles being unusually high for a church of this size. There is little ornamental detail, and what there is is chiefly in the capitals of the engaged columns supporting the main arches, several of which are rude in design and certainly not later than the eleventh century. The plan shows a number of irregularities, the piers vary considerably in design, and the arches, even when concentric, exhibit many irregularities. The piers of the nave incline slightly inward as they rise from the floor, a circumstance that the accomplished historian of the cathedral, M. Brutails (Monographie de la Cathédrale et du Cloitre d'Elne: Perpignan, 1887), believes to be a deliberate artifice practised by the builders. There are many indications of repairs and alterations to the piers and arches, though the records of their date have been lost.

A small door in the north aisle between the first and second bays, admits to the cloister, the most beautiful portion of the cathedral, and



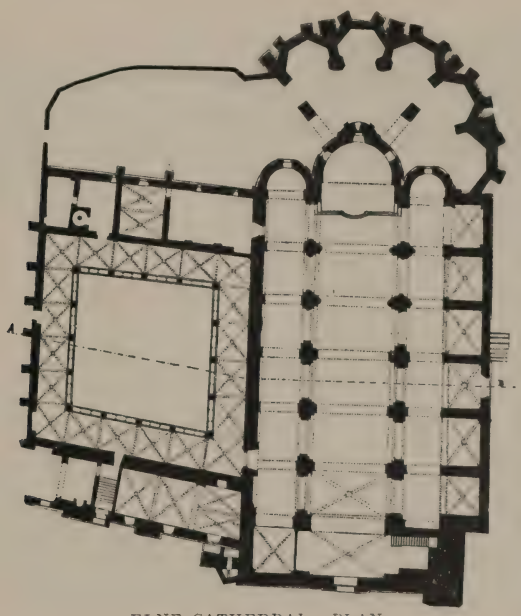
ELNE CATHEDRAL—TRANSVERSE SECTION.

From Brutails.

one of the most celebrated in France. The cloister of Elne is, in fact, known to many to whom the cathedral itself is unfamiliar. It fully justifies its celebrity, for few cloisters in France are more beautiful. As usual it is irregular in plan, the east and west galleries having a decided inclination toward the east at the north end. The west gallery adjoins an unimportant group of buildings, formerly used for the administration of the chapter, the hall of archives and other apartments. In the east gallery a small, low door towards the north gives access to a spiral stairway that once led to the upper cloister, removed in 1827; but a delicious view can be had from the roof, and we can well believe this place to have been a favorite resort of the canons attached to the cathedral. Another door leads to a small, low, rudely built subterranean chapel, formerly dedicated to S. Laurent. A vaulted hall, adjacent to the cloister and entered through a sacristy, was once known as the chapel of the Passion, or of the Blood

of Jesus Christ. It was in ruins in 1531, but was repaired by the end of 1534. The north gallery, overlooking a steep descent, is supported externally by a heavy buttressed wall.

The design is the usual type of the twelfth century. At each angle of the trapezoid is a large rectangular pier, rather plainly treated. The intervening space is divided into four bays by similar piers, whose capitals are rectangular panels decorated with scenes from the Bible and from legend, surmounted by a richly carved abacus. Each bay contains three round arches, supported on double columns—plain, twisted, octagonal—ornamented with series of closely set leaves or with interlaced bands of foliage, a charming irregularity that gives so much life and vitality to the whole. The capitals of the columns



ELNE CATHEDRAL—PLAN.

From Brutails.

are decorated with conventionalized animals, with scenes from monastic life, with episodes of bible history, or with foliage. In general, the capitals towards the quadrangle are foliated, those towards the galleries are pictorial; but in the east gallery both series are pictorial. The vaults are Gothic cross-vaults of the thirteenth century.

The diversity in this carving, all of which is of a delightful quality, is not confined to the design alone. There are many indications of varying dates, Gothic capitals in one place surmounting Romanesque columns, with many instances of a reversed process. So marked is this irregularity that it has been supposed by some writers that the cloister dates from at least two distinct periods. This, however, is not borne out by the facts. The differences are too closely

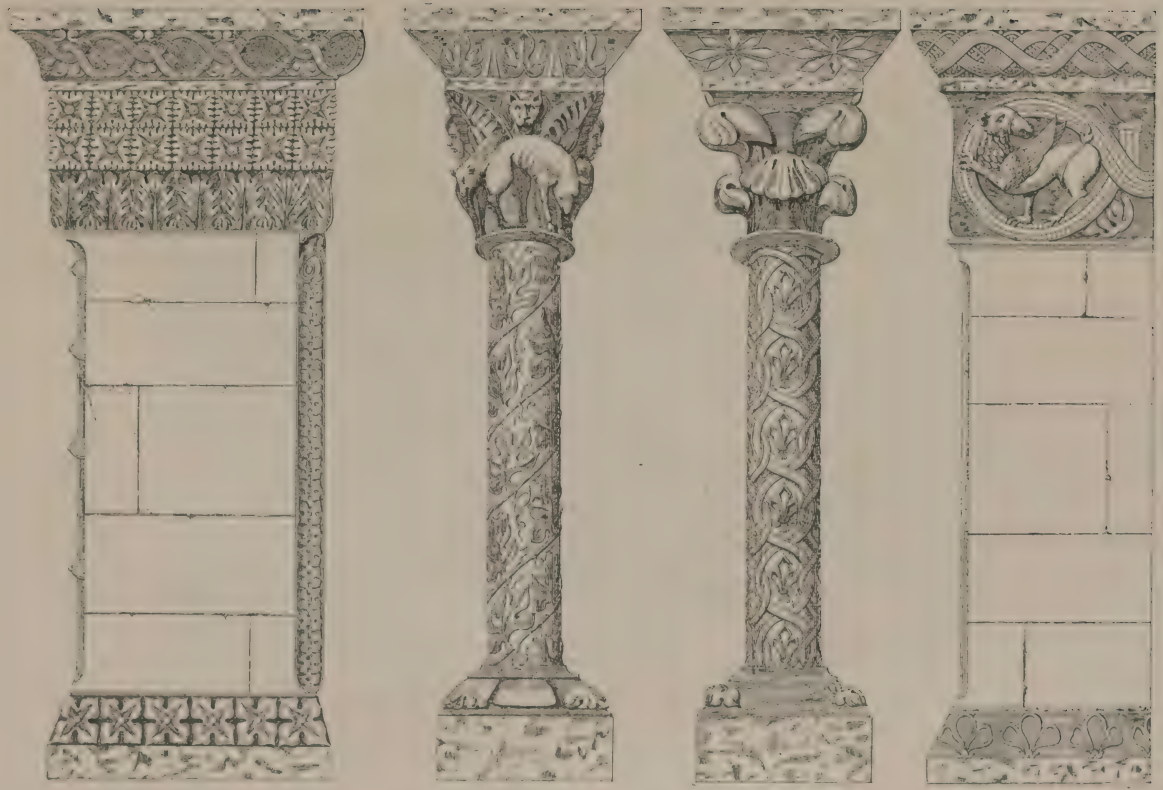
mixed and too well distributed throughout the cloister for this to be at all probable. On the contrary, it would appear that these changes were simply alterations, necessitated from various causes, and made from time to time as required. The cloister was built about 1175, under the episcopacy of Guillaume Jorda (1172-1180), the first prelate to be buried in it, and whose effigy may, perhaps, be seen in the sculptures of the central pillar of the south gallery. In 1285 the city was sacked by Philip the Hardy and the cathedral seriously injured. Repairs in the cloister were begun soon after, and the last work was done about 1385. The date 1285 is a notable one in the history of the cathedral; not only were restorations begun in the cloister, but the bishop and the chapter planned a new choir and apse, of which the



ELNE CATHEDRAL—THE CLOISTER.

foundations are still visible—a Gothic structure with radiating chapels—but which was never finished. Donations continued to be made to the repairs as late as 1404.

The charm of this cloister, as in all Romanesque cloisters, is in the superb carving of the capitals of the piers and columns. In a Gothic cloister it is the delicacy of the architectural forms that delights one, for as the builders increased in skill they developed a fondness for refined building rather than for the elaborate pictorial sculpture with which the Romanesque builders ornamented their structures. The architectural parts are somewhat heavy, though the vaults are not. The piers are of unusual size, with simple bases and a small roll moulding worked in on the edges. The arches, owing to the thick-



ELNE CATHEDRAL—PIERS AND COLUMNS IN CLOISTER.

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ness of the cloister enclosure, are deep, generally treated with a hollow moulding towards the galleries, decorated with bosses or other small ornaments. In the west gallery, however, there is no internal ornament. Apart from the carved ornament in the cloister the chief feature of interest is the doorway, through which it is entered. Plain towards the church, on the cloister side it is developed into a charming Gothic portal, richly moulded, though without ornaments. The slender columns are alternately of red and white marble. Their capitals reproduce the foliage of the region.

The carved decoration includes a great variety of motifs. The capitals are foliated or treated with symbolic animals or with scenes from the Bible. Those of the great piers are more important, the sculptors there having more space, and space better suited for pictorial design. They are not, in fact, so much capitals as carved panels that fill the function of capitals. We have the creation, the death of the Virgin, the appearance of Christ to the Magdelene, the story of Lazarus and the rich man, the massacre of the Innocents, the adoration of the Magi, Christ on the way to Calvary, and other incidents. Many of these scenes are treated with the delightful frankness of the period; others are more complicated in their arrangements; but most of them are very clear and distinct in their meaning and purport.

From Elne the traveller in France must turn his face northward, and, in a measure, retrace his steps over the ground traversed in order to reach this little known portion of France. In our survey of the cathedrals of France we have more than once had occasion to visit the cathedral cloisters; but in our future journeys we shall meet with few of them. Not many of the Gothic cathedrals retain their cloisters, and the cloister of the south, the Romanesque cloister, is of a type peculiar to itself. That at Elne is of a type common to them all. It emphasizes an important period in ecclesiastical architecture and one takes away from it, not only that lesson, but the memory of a delightful and almost unknown corner of France.

Barr Ferree.



BOSTON

AMERICAN SOCIETY OF CIVIL ENGINEERS,

Cyrus L. W. Edlitz, Architect. 220 West 57th Street, New York City.



SCHOOL AT 108TH STREET, BETWEEN AMSTERDAM AVENUE AND THE BOULEVARD.

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THE SCHOOL BUILDINGS OF NEW YORK.

TURN at once to the tailpiece of this article and see there the image of the "little red schoolhouse" of our youth.

Such, no doubt, was in the minds of the fathers of the republic when they first conceived of universal state education as a part of the government which they were founding. Profoundly astonished would they have been could they have seen the vision of what was to come, such as is shown in the picture of the latest and biggest schoolhouse at the head of the article.

For the people of those days, brief as the time in years has been, modern times had not begun. They could not fancy the ultimate northern confines of New York as farther away than Chambers street; nor that their descendants would smile to see that their fathers had built the north side of the City Hall of a rougher stone, the rest being of marble, under the impression that nobody would ever go around to the back of it—now, when there are ten miles of densely built city to the north for a single mile to the south! Even Paris at that day was but a town of half a million.

But modern times are upon us; have come upon us, and are still rushing on, with such celerity that we can scarce keep up with them. The vast modern city—a new thing in the history of the world—grows, as a microbe colony grows, millions almost in a night, so that we strain ourselves to build schoolhouse after schoolhouse, each fitted for its thousands of children, without outstripping our needs.

Until recent years the schools of New York were in a desperately bad condition, chiefly owing to this fact that their builders did not realize what was coming, as we ourselves probably are doing still the most inadequate things, judged by the light of the future.

Most of these buildings still survive, improved, as far as may be, with the means and opportunities at hand, and some day to be replaced, no doubt, by better things.

Such a building is the old school (sixty-three years old) at No. 371 Madison street, Fig. 1.



FIG. I.—MADISON STREET SCHOOL.

In the back these old schools are still less prepossessing than in front.

Here, for instance (Fig. 2), is the rear of the Madison street school, a corner of the "playground," thus in name this hole is dignified.

This is the normal "playground" of the time, as the school is flanked only by comparatively small houses, such as that shown, low, and, what is even more important, of no great depth, leaving a passable supply of light and air for the playground.

In this case the house adjoining is but three stories high, and perhaps thirty-five feet deep; such as New York mechanics lived in before the day of the tenement house.



FIG. 2.—PLAYGROUND OF MADISON STREET SCHOOL.

What happened when great tenements were built in place of these small houses is shown on the next page.

This is the yard or playground of the Allen Street School (Fig. 3). The tenement-houses that hem it in cover almost every foot of the adjacent land, and enclose the school yard with lofty blank walls, that cut off all light, except what glimmers through the crevice that we see.

Another yard of the same kind—that of Chrystie Street School (Fig. 4)—showing a fire-escape, which is, of course, indispensable, as all of these old buildings were of combustible build, but which darkens most seriously the interior of the building as well as the yard.

In these last two pictures, notice the low buildings with sky-lights. These are the modern temples of Venus Cloacina, that have replaced the wooden privies of yore.

Inside these old buildings are as inadequate, although it is impossible to illustrate their condition so well, simply because the worst cases are too dark to photograph. Here, however, is one, obtained by forty minutes' exposure—photographers will know what

that means—yet to the eye it is much darker than the photograph shows it (Fig. 5).

It is the first, or entrance, story of the Twenty-third Street School, used, as the first story in all New York schools is used, as a playroom. The doors which have been opened to give light enough for a photograph, are the entrances from a playground, darkened as we have seen.

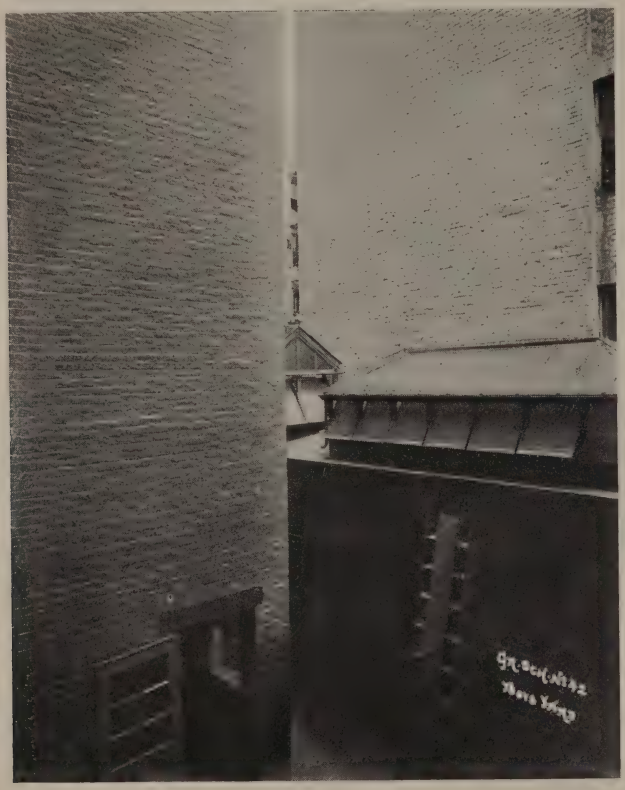


FIG. 3.—PLAYGROUND OF ALLEN STREET SCHOOL.

With one other illustration, this of a darkened classroom, found in a school in Seventeenth street, near Eighth avenue, we must content ourselves (Fig. 6).

Within a few years, under the able direction of the architect, Mr. C. B. J. Snyder, the Superintendent of School Buildings, a revivification has taken place in the construction of New York school buildings. Many problems needed solution in their arrangement and construction, as well as in the vital considerations of air and light, or rather in connection with these considerations.

One of the first and most important moves was toward securing more open space surrounding schools, that could be depended upon as permanent. In the case of many old schools adjoining land has



C. B. J. SNYDER,
SUPERINTENDENT OF SCHOOL BUILDINGS.

been bought, the buildings thereon pulled down and a portion of the new space covered with an addition to the school, still leaving a large part to illuminate and refresh the whole building.

Where new schools have been built, open land has been secured in various ways. In the outlying and half-country parts of the city, where the land was still cheap enough to permit, the school has been built in the midst of ample grounds, as in this one at the corner of Andrews and Burnside avenues (Fig. 7).



FIG. 4.—PLAYGROUND OF CHRYSTIE STREET SCHOOL.

In the more closely built parts the school was either built upon a corner, or sufficient space was left free within the boundaries of the school land, as we shall see in all the examples of the newer schools.

Such, for instance, is the school at 140th and 141st streets and Edgecombe avenue. (Fig. 8.) The building is one of the earliest of the new order of things. It has three fronts on streets, the principal, on Edgecombe avenue, being some two hundred feet long. The photograph of this school is interesting also because the open fields and market gardens, that occupied the foreground when the picture was



FIG. 5.—PLAYROOM OF 23D STREET SCHOOL.

taken, are now quite covered with four and five-story stores and flat-houses, standing shoulder to shoulder (Fig. 8).

Similarly situated, as to street frontage, is the school at 117th street, and St. Nicholas avenue, dating from the year 1894, shown in Fig. 9.



FIG. 6.—DARK CLASSROOM OF SCHOOL IN 17TH STREET.



FIG. 7.—SCHOOL AT ANDREWS AND BURNSIDE AVENUES, MORRIS HEIGHTS.

Another school with two street frontages, that at Ninth street and First avenue, built in 1895, is shown (Fig. 10); and another at Chrystie and Hester streets, built in 1893 (Fig. 11).

Admirable as are these sites with abundant street frontage, they have two serious defects: First, they are far more costly than are sites of equal area in the interior of a block; secondly, they are not



FIG. 8.—SCHOOL AT EDGECOMB AVENUE BETWEEN 140TH AND 141ST STREETS.

always to be had at any available price. For, although land may be taken by condemnation proceedings for school purposes, except when occupied by ecclesiastical associations, the cost of highly improved sites is naturally prohibitory. It is, therefore, necessary at times to arrange schools so that there may be enough vacant space within their own boundaries to supply air and light.



FIG. 9.—SCHOOL AT ST. NICHOLAS AVENUE AND 117TH STREET.

For an example there is the nearly completed school in Eighty-ninth street, between Amsterdam and Columbus avenues, of which a plan is given below (Fig. 14) and a picture of the outside. (Fig. 12.)

Another school, hardly yet completed, and occupying an ideal site for a city school, covering the whole of a block bounded by four streets, is shown (Fig. 13), and the plan, with large additional court yard space (Fig. 15).



FIG. 10.—SCHOOL AT FIRST AVENUE AND 9TH STREET.



FIG. 11.—SCHOOL AT CHRYSTIE AND HESTER STREETS.

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FIG. 12.—SCHOOL AT 89TH STREET, BETWEEN COLUMBUS AND AMSTERDAM AVENUES.



FIG. 13.—EAST BROADWAY, GOUVERNEUR, HENRY AND SCAMMELL STREETS.

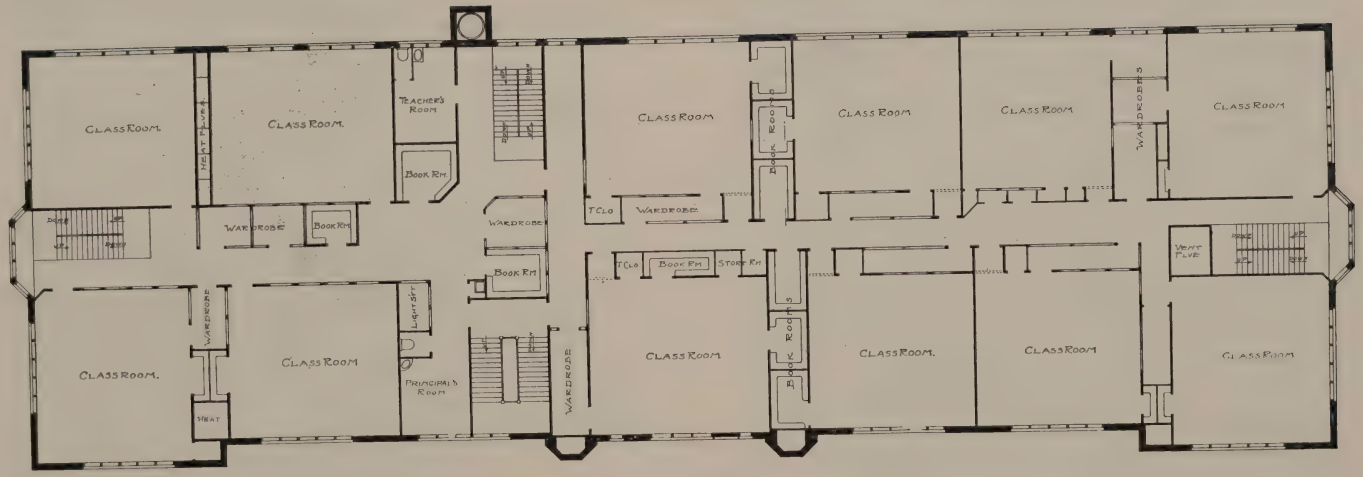


FIG. 14.—PLAN OF WEST 89TH STREET SCHOOL.

Most interesting, however, in connection with this question of site, is the plan of the 108th Street School, of which the picture of the exterior heads this article.

It constitutes a part of the plan of a typical school given on the next page (Fig. 16). The 108th Street School is somewhat more than half of the typical plan. At a future time the other wings will be built on the rest of the lot.

This clever plan is that which originated in Mr. Snyder's active mind and which has been worked out by him, as most available for New York schools; and it is that toward which new schools will



FIG. 15.—PLAN OF SCHOOL AT EAST BROADWAY AND HENRY STREET.

tend to conform, as far as circumstances permit. All architects will appreciate the skill with which this plan has been devised to cover the needs of the case. It is two hundred feet in its greatest dimension, that being the distance between the streets in the regularly laid out parts of New York City. In width it may be a hundred and fifty feet or more, that shown is of that width. New York city lots are twenty-five feet wide, and twenty-five feet is therefore the unit in laying out larger plots.

On each front the plan presents an ample court, large enough for a spacious paved space for a playground, and for trees and shrubbery in addition, much to the advantage of the untaught training of childhood, as all will testify whose early years have known some

elm-shaded country school grounds. Such are the silent influences that make through life dear to us—

"the schoolboy spot
We ne'er forget, though there we are forgot."

Next in importance to the general plan is the arrangement of the interior in detail. In the designing of a classroom, which is the unit of the school building, contradictory conditions prevail. The first two requirements are air and light in plenty, for which high ceilings,

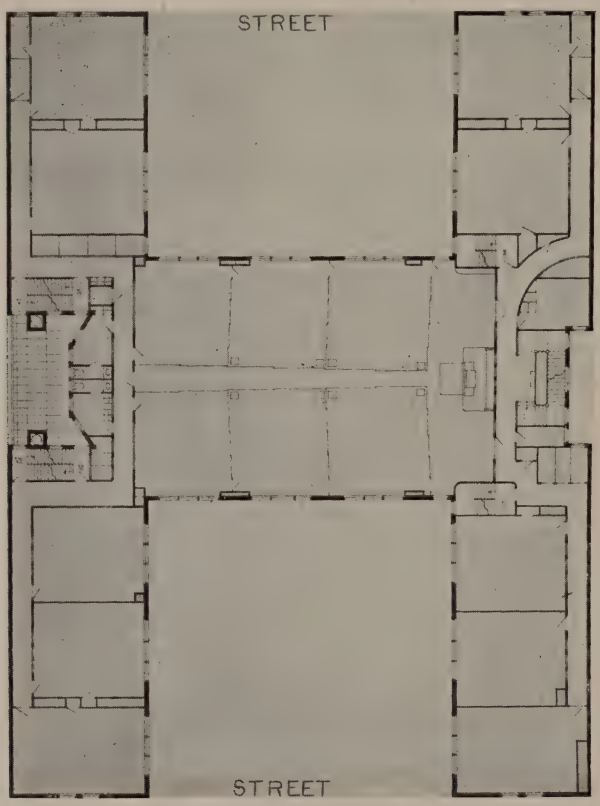


FIG. 16.—PLAN OF TYPICAL SCHOOL.

large windows, and few inhabitants are needed. The last cannot be complied with. The inhabitants of the schoolroom cannot be few. At its best, with the limitations to crowding that have been found absolutely necessary, a schoolroom is still far from sparsely populated. Forty grammar, fifty primary pupils, for a room about twenty-six by twenty-two feet, has been laid down by the New York school authorities as the greatest allowable number of pupils, which gives about thirteen square feet of floor space, and one hundred and eighty cubic feet of air space to each pupil. This is with

a ceiling fourteen feet high in the clear. That height of story has been fixed because it gives double headway, which permits the use of double stairs, a space-saving invention that is much used. The drawback to these high ceilings is that they impose much laborious stair-climbing upon both teachers and pupils.

The shape of the classroom ought to be approximately square. Oblong rooms that have windows in the long side are better lighted, yet such rooms, if of the required area, place the pupils at the far end beyond the easy reach of the teacher's voice.

On the other hand, the great cost of land of city sites, cause a pressure in the other direction, toward the elongation of the rooms



FIG. 17.—FULTON AVENUE AND 173D STREET.

away from the light, that being, of course, the way in which most rooms can be lighted from a given courtyard or street frontage.

Whatever the shape, large windows are essential; and in this was one of the chief short-comings of the old schools.

Compare, for example, the front of one of the old schools, which we have illustrated, with that above, at Fulton avenue and 173d street, or with that following, at Madison avenue and 119th street; still more with the one after that, at Henry, Catharine and Oliver street, all nearly or quite completed (Figs. 17, 18, 19).

The former two, it may be observed, are lighted by couplet and triplet windows in all the principal rooms, giving an area of per-



FIG. 18.—MADISON AVENUE AND 119TH STREET.



FIG. 19 —HENRY, OLIVER AND CATHERINE STREETS.

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FIG. 20.—ST. NICHOLAS AVENUE AND 126TH STREET.



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FIG. 21.—RIVINGTON AND SUFFOLK STREETS.

haps 50 per cent. of the wall to the openings. In the last-named all the windows are triplets, giving about 60 per cent. area of openings, in comparison with 25 or 30 per cent. of the old schools.

To obtain this large area of windows, the ordinary construction of buildings had to be abandoned in favor of the skeleton steel frame construction that is usual in high buildings. School buildings, indeed, are not high, in the modern sense, not more than five stories, while a building nowadays is hardly called "high" that is not over eight stories. It was not to support increased weight that steel construction was used, although all of the recent schools are much heavier than the old, the floors being made of fireproof terra



FIG. 22.—PLAYROOM OF SCHOOL AT ST. ANN'S AVENUE.

cotta blocks, supported by steel beams. But the New York building laws, for every increase in the size of windows, require a very great increase in the thickness of the walls; so great that the steel frame, costly though it is, is actually cheaper. Thus, to secure large windows, the steel frame had to be used. Below is shown the new school at 126th street and St. Nicholas avenue, and that at Rivington and Suffolk streets (Figs. 20, 21), both of which, as well as almost all of the other new schools, have skeleton steel frames.

The rear windows are also made as large as possible. Compare those of the school at Madison avenue and 119th street, built in 1894, with those seen in the Madison Street School (Fig. 1). In many of these old schools, the rear walls have been taken entirely out and rebuilt, for the sake of the large windows thus obtained.

In all of the new schools, and by new we mean those built since, let us say, 1890, or thereabouts, certain general points of construc-

tion have been insisted upon. The playrooms, which constitute the first story in all New York schools, have been built with high ceilings and large windows, making them light and cheerful as well as healthful. Such is the playroom, shown below, of the school at St. Ann's avenue (Fig. 22).

Many other points wherein the Superintendent has worked reform are suggested by this view. The bright light that is uniformly diffused throughout the room is even more striking when compared with the old schools by actual inspection than upon

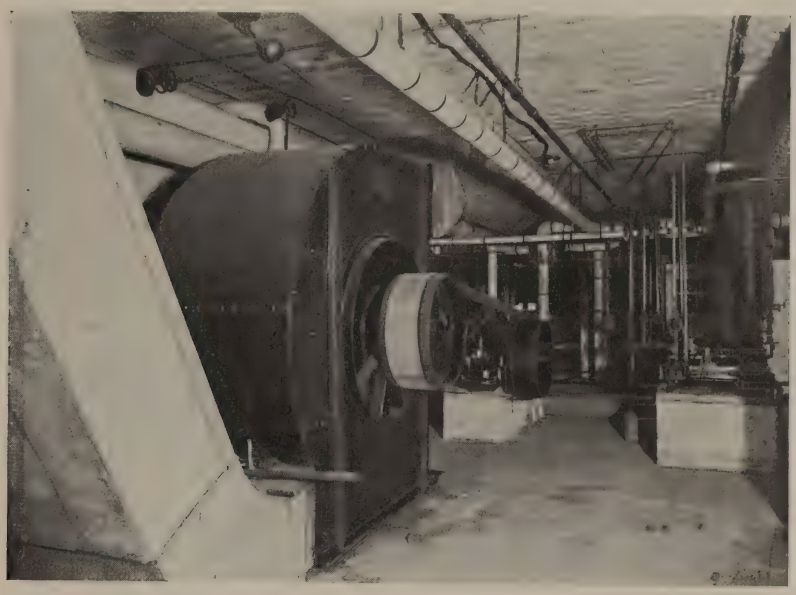


FIG. 23.—EIGHT FOOT FAN BLOWER.

merely comparing this photograph with that of Fig. 5. By long exposure the recesses and dark corners of the latter, which the eye can hardly penetrate, appear in the camera as, at the worst, but gloomy; while a moment's glimpse of the former shows apparently blacker shadows than any in the other. In fact, the black shadows of the well-lighted room are really lighter than the grey obscurity of the older building.

All of these new playrooms have been paved with asphalt in place of the perishable and uncleanly board floors of the past, and asphalt is used also wherever else it properly can be used for flooring; not in classrooms, for it would be too bare and cold, but in all halls and passages, and in all wardrobes which are meant to be entered.

In the background in this same playroom is seen a set of sliding

doors. These divide the playroom into two parts when they are closed—one for boys; one for girls. They are thrown open and the whole room thrown into one on certain occasions. This provision is especially intended to permit the playroom to be used for evening lectures for which these playrooms are well adapted otherwise. Entered as they are, as nearly as possible at the street level, there are no stairs for the audience to climb, nor to impede them in case of panic. The number of entrances which are all available as exits, and the accompanying consciousness of safety within easy reach, conduce to diminish the chances of a scare to which the unbalanced emotion of the populace is especially subject.

Much thought has been given to obtaining proper materials for the schools, and many experiments have been tried. The walls of the playrooms two or three years ago were of red brick. This was durable enough, and not easily defaced with chalk or charcoal, but failed in light-reflecting qualities. Now the playrooms are wainscotted as high as a child can reach, six feet or so, with a specially made glazed brick, green or brown in color—impossible to chip, cut or write upon. Above that nothing better has been found for walls and ceilings than the whiteness of good plaster. No doubt white glazed brick for walls, and white glazed tiles for ceilings would be still better, but the cost at present forbids. The future may see school interiors of white glazed clay materials, and white mosaic floors of marble or porcelain, and look in a superior way at our best efforts as we do at the brown painted boards that were the best our ancestors could do.

Still dwelling on the same playroom photograph, there is seen above on the ceiling a curious-looking boxed-in affair dependent. This is the main air duct for ventilation, through which is drawn the fresh air supply to be warmed and forced to the rooms in the stories above. The plans of schools previously given show the square pipes through which the air is carried upward.

In all of the larger schools, those of perhaps twenty classrooms or more, a blowing apparatus is used to furnish the fresh air to the classrooms. The same results might be obtained by heating the exhaust flues, but it is well established in scientific ventilation that a pound of coal will move more air by mechanical power, than by merely warming it. The fans are placed in the cellars. One of them is shown in Fig. 23; a big fellow it is, an eight-foot wheel, the janitor, who is also the engineer, calls it. In the smaller schools the cost of the mechanical apparatus prohibits its use, and the air is moved, less advantageously, by heat directly applied. Even when blowers are used the air must be warmed before it is forced through the building. Besides the supply of warm air, additional heat is needed in cold weather: for this direct steam radiators are used, placed in the classrooms as required.

Steam, by one method or another of use, has been found the most available means of heating. Hot water has been tried in one case, that of the school at Ninth street and First avenue.

For some of the smaller schools hot air furnaces are used, indeed there are so many points to be considered in adopting a system of heating and ventilation that each school must be studied separately.

The perfect system, no doubt, is that of mechanical distribution, but in practice it must sometimes give place to other methods.



FIG. 24.—GYMNASIUM.

The question of artificial lighting is a difficult one. Ordinary school work needs none, but for evening school sessions, such as are held in many city schools, and for evening lectures, which are more and more demanded, artificial light is required. Gas is commonly used, but is far from satisfactory, as the products of combustion foul the air. Electricity is better in this respect, and is being substituted, as rapidly as funds permit, for gas, in all evening schools, especially in the old buildings—in the new buildings it is generally introduced.

Some schools have been fitted up with dynamos and electric plant of their own, as an experiment, of which the advantages are already seen.

The St. Ann's Avenue School, finished in 1897, like so



FIG. 25.—CARPENTER SHOP.



FIG. 26.—COOKING ROOM.

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FIG. 27.—HESTER AND ORCHARD STREETS.



FIG. 28.—WEST 77TH STREET.

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many of the newer schools before shown, has a story in the pitched roof, above the regulation four stories below. Four stories are the rule, the first for the playrooms where the children rendezvous; the second for the smallest children, next to the tiny kindergarten pupils; the third for children of intermediate size; the fourth for the largest, upon the entirely reasonable principle, that the bigger they are the higher they are able to climb. But wherever a fifth story is seen it is devoted to the department of



FIG. 29 —EXTERIOR CARVING.

manual and physical training, to keep pace with the new lights that have blazed for us in these latter days in educational matters.

And it must be confessed that an inside view quite justifies the doctrines of the new lights.

Gymnasiums there are, and carpenter shops, cooking rooms, or culinary departments, in the magniloquent official nomenclature, and sewing rooms and modelling rooms, all quite fascinating to the mind of the visitor, with the intense interest that doing has, above thought, for almost everybody.

Look at this gymnasium for a specimen (Fig. 24), with its trapeze rings and climbing rope hanging from the ceiling, its parallel and horizontal bars, and leaping hurdles and mattresses on the floor.

Or at this carpenter shop, with its strong benches, and vises and closets full of polished tools, enough to attract anybody (Fig. 25).

Here again is the cooking-room, just across the hall (Fig. 26), with its gas ranges, and polished "batterie de cuisine," where the only difficulty might be to impress the pupils that the processes shown were practicable with their own black and solitary saucepans.

The very latest idea in school building, and an eminently reasonable and satisfying idea it is too, is to provide a playground on the top of the buildings, to supplement those in the yards below and to save the long travel to the first story for the pupils in the fourth and fifth stories.



FIG. 30 —STAIRCASE.

Two photographs of the most recent schools, one at Hester and Orchard streets, the other at 77th street, hardly yet completed are Figs. 27, 28.

In all of these, the high parapet above the cornice marks the existence of the roof playground behind it. In two of them, if you look closely, may be seen some indication of the wire mesh-work with which the whole roof playground, top as well as sides, is enclosed. Nothing less was deemed sufficient to ensure the safety of the more aspiring spirits of the East Side boys, who would scale any mere fence, however high.

Space fails to describe the innumerable evidences of careful thought that are observable everywhere—the snow-melting apparatus, heated by steam, into which the snow on the roofs may be quickly shovelled and disposed of—the white tile enclosed stairways—the catch-basins in the yard pavement, a special invention that cannot be plugged with paper or anything else by the cleverest infant mind.

With all this the architecture of the buildings has not been neglected, for as education ceases to be conducted by factory methods it is well that the walls where education dwells should signalize the change by forsaking their factory appearance.

In addition to the general designs, two scraps of detail, one of a main stairs, one of exterior carving are given, neither of them even the best of their kind in the schools, but the best just now obtainable.

The coloring of the newer schools is most happily confined to the greys and browns, and sometimes lighter cream tints of stone or modern brick.

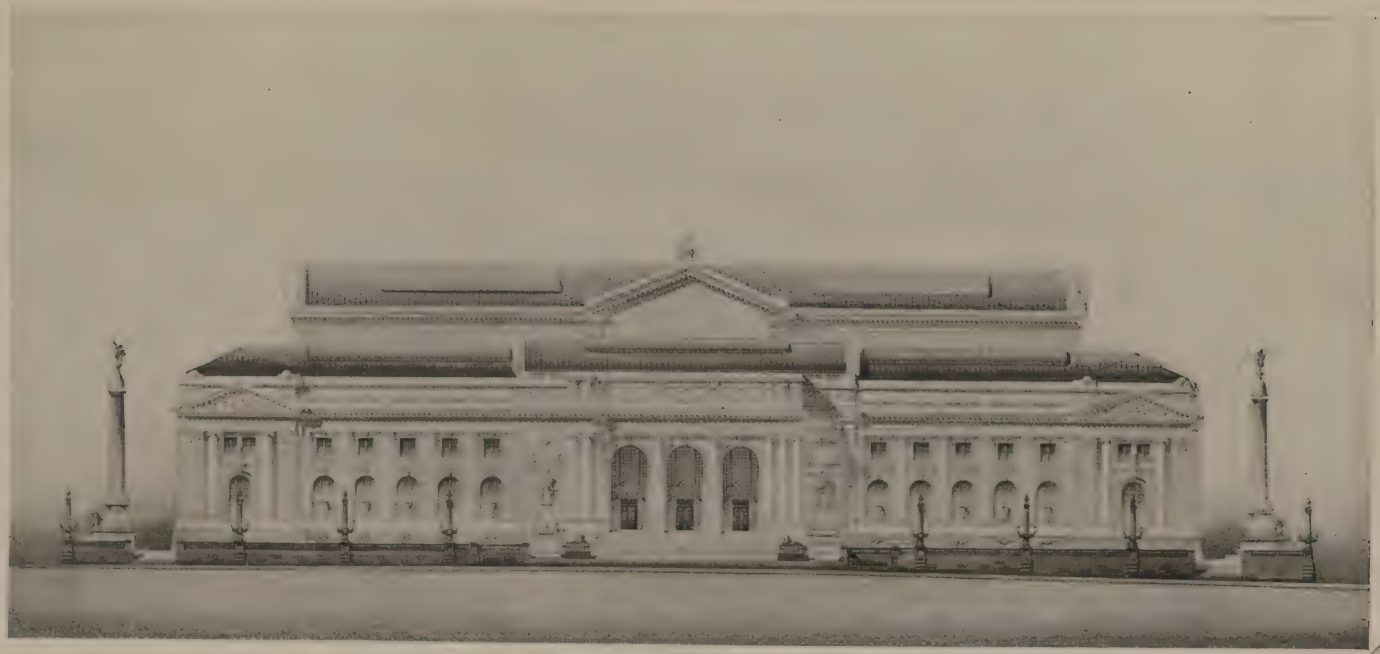
Red brick, however artistic when set in greenery, is not at its best when set in the interminable red brick of a city; the eye welcomes a quieter color.

With all this, the cost of the newer fireproof buildings, by figures accessible to all but too dry to recount here, are actually less in cost per pupil than the far inferior and combustible buildings of past years.

John Beverley Robinson.



VILLAGE SCHOOL AT THROGG'S NECK.

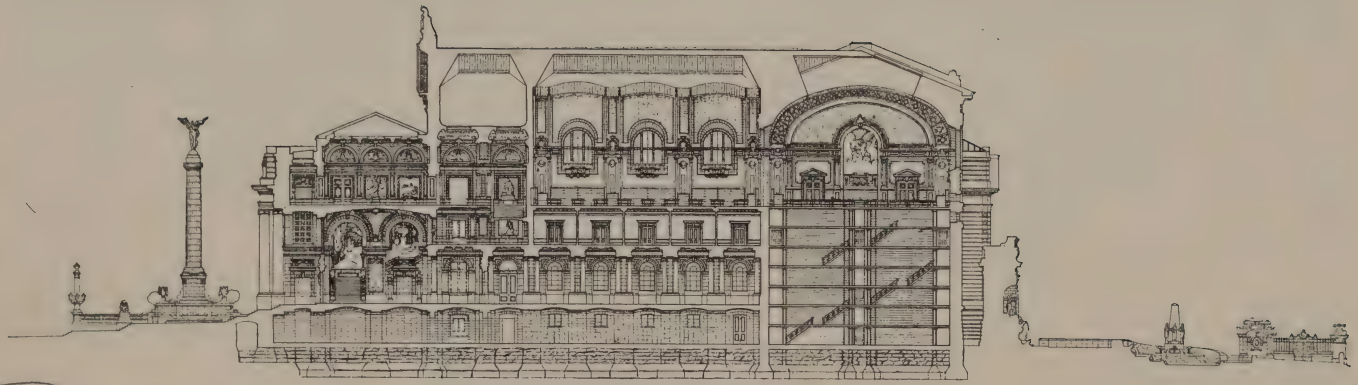


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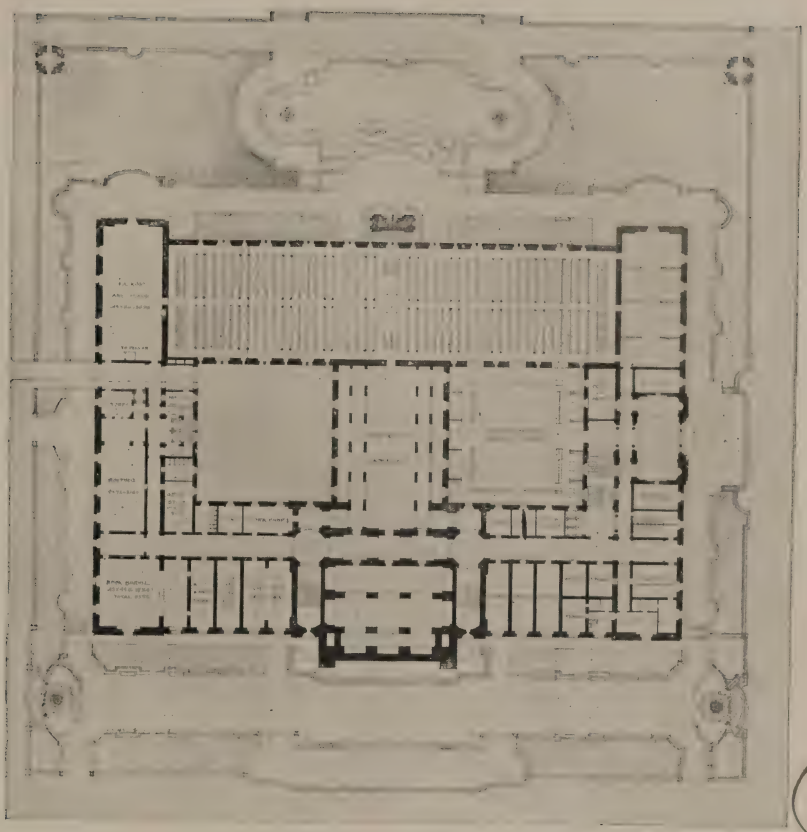
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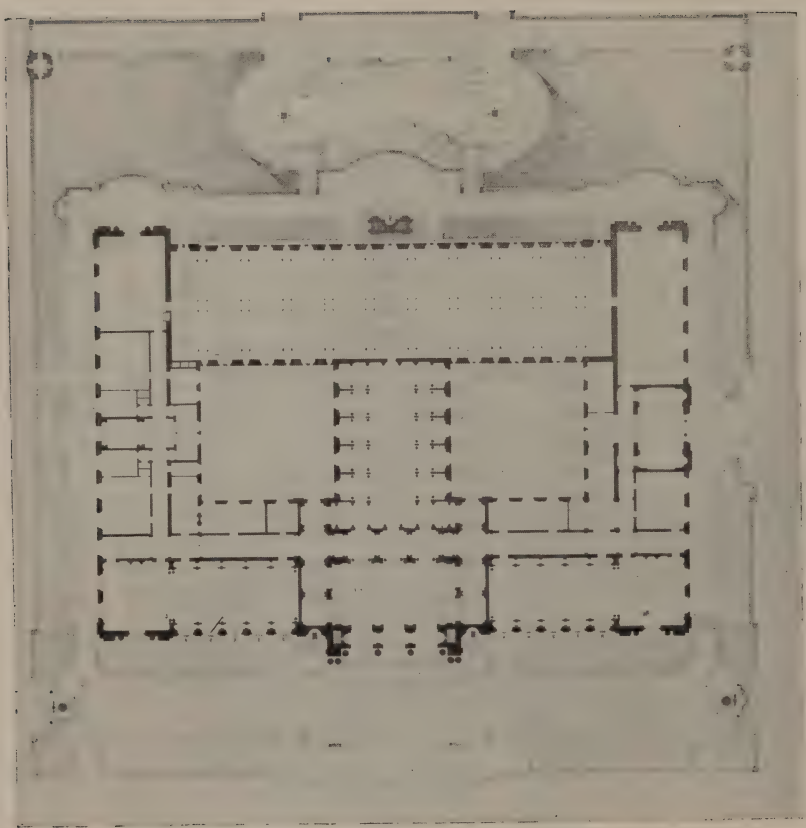
LONGITUDINAL PLAN.

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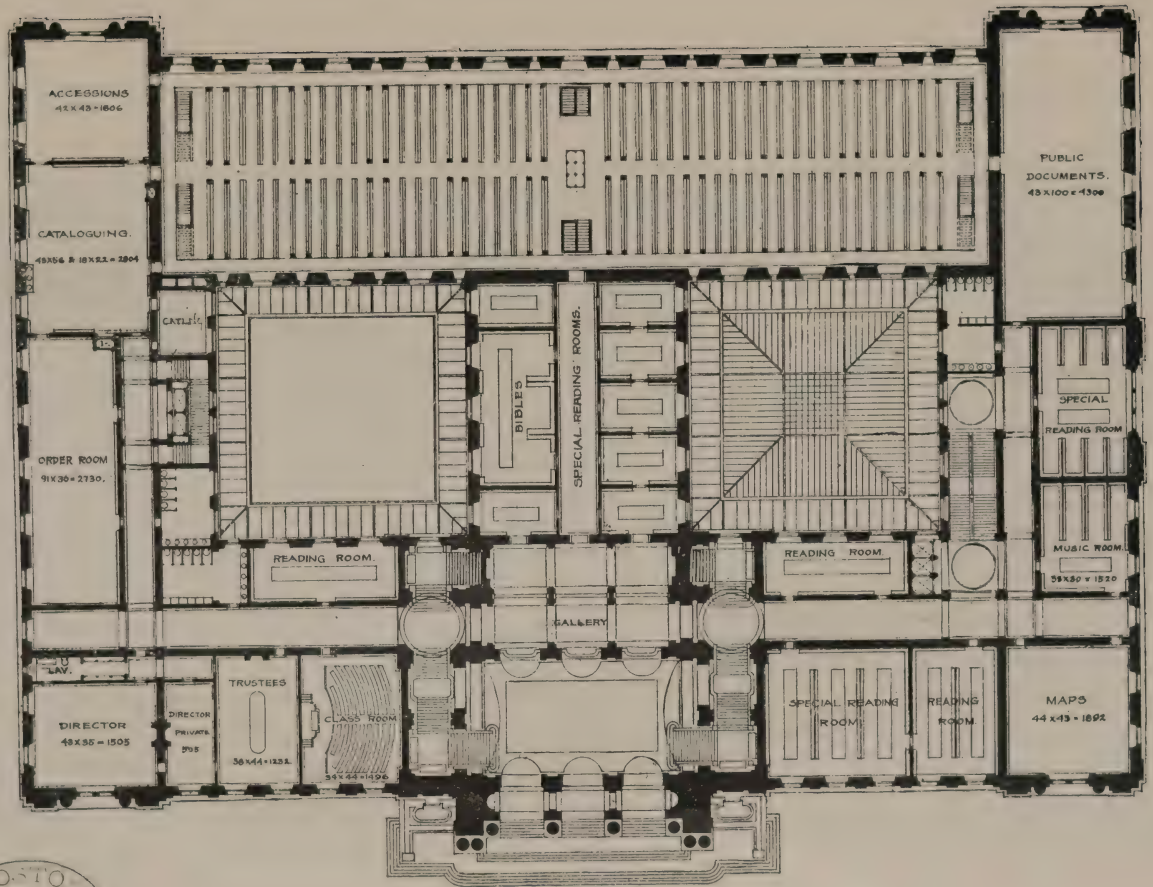
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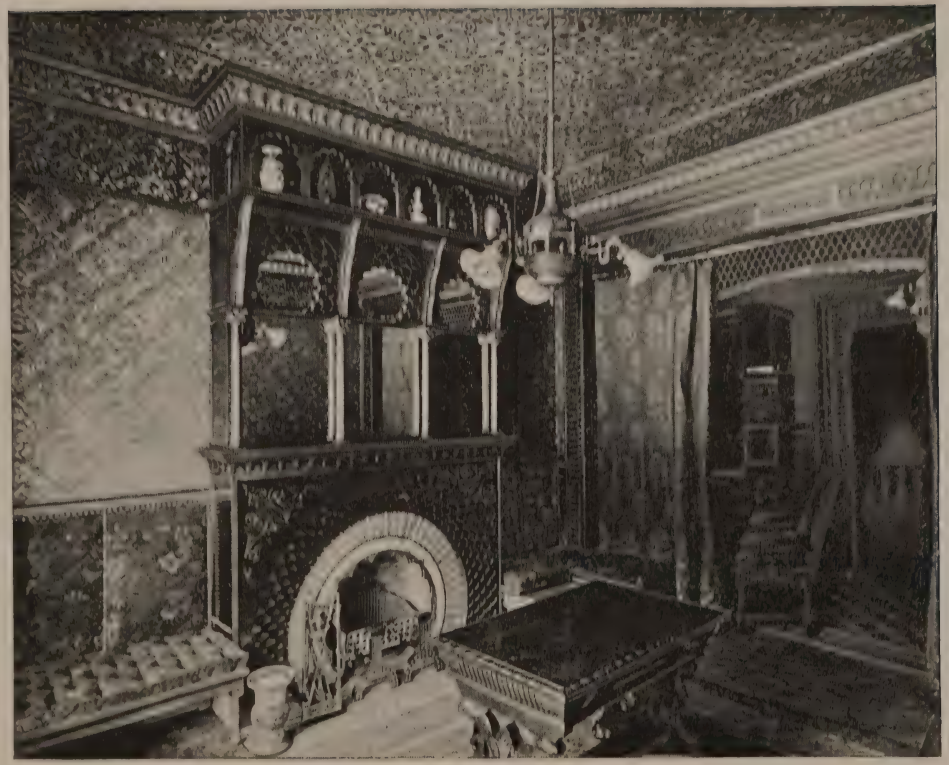
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FAILURE AND EFFICIENCY IN FIRE-PROOF CONSTRUCTION.

THE widespread interest that has recently been developed in fire-proof construction is no surprise to those who have made a careful study of the subject. The enormous fire loss, so faithfully tabulated and published annually, has for years been a mute but significant object lesson, representing, as it does, a large portion of human effort that is irretrievably lost.

Until very recently, fire-proofing methods in this country, contemplated the use of the burnt clay products solely. Manufacturers of that material have varied the forms and devised new methods of applying it, but the merits of the so-called improvements have never been established by practical tests. The fire tests made in Denver, Colorado, in December, 1890, so often quoted in trade publications, and which for years satisfied the public mind as to the efficiency of the burnt clay products, were conducted without any facilities for recording accurate temperatures and, like many other tests of later date, were so crude and unscientific in their character as to be absolutely valueless.

It is to be regretted that architects, as a class, have given so little thought and study to so important a feature of modern building construction. Absorbed in the more artistic details of their work, they almost invariably consign the problem of fire-proof construction to the care of a subordinate whose facilities for investigation and study are usually very limited, and who wisely adheres to the usual and established practice, however faulty or questionable that may be.

Burnt clay "fire-proofing" has been installed in buildings in this country very extensively since 1889, without any definite knowledge either as to the actual fire and water resisting properties of the material or the best methods of employing it. What is the result of groping about in such ignorance? The answer is to be found in such fires as occurred in the Temple Court and Manhattan Savings Bank buildings of this city; in the Athletic Club building of Chicago, and in the Horne store building of Pittsburg. These are only a few of many instances in which the efficiency of burnt clay fire-proofing has been found wanting, and they serve to indicate how imperfectly the art of fire-proof construction is understood. In cases where recognized or standard methods of fire-proofing have either wholly or partially failed, it has been customary to criticise the methods employed or the workmanship, and failing to account for all of the phenomena in this manner, to enshroud the facts in the mysterious atmosphere

of the unaccountable. Even so eminent an authority on insurance matters as the well-known manager of the New York Tariff Association, confesses his inability to account satisfactorily for some of these phenomena. One set of floor arches, he says, will soon fall out completely, while another, apparently similar, will resist a fierce and protracted conflagration without losing anything in strength. The solution of many of these perplexing problems is undoubtedly to be found in the temperature of the fires to which the material was subjected.

The recent fire and water tests of fire-proof floors, made by the Department of Buildings of New York City, were the most elaborate and instructive that have ever been made in public in this country. These tests brought out clearly what was not generally known prior to that time—that Portland cement concrete is an excellent fire and water resisting material, and, as such, is superior to the burnt clay products. In this connection it may be interesting to note that as long as eight years ago the linings of the Dietzsch cement kiln were changed from magnesian fire clay brick (a vastly more refractory material than the ordinary burnt fireclay fire-proofing) to Portland cement concrete. In the manufacture of Portland cement temperatures of 2,600° to 3,000° Fahr., are obtained, and considerable difficulty was experienced on account of the melting of the burnt clay linings, which, when fused, became attached to the charge in the throat of the kiln. This difficulty was remedied by substituting a Portland cement concrete lining, which has since been in use. (See Ciments et chaux Hydrauliques, by Candlot, page 55.)

The greater portion of the burnt clay fire-proofing is manufactured at temperatures varying from 2,000° to 2,300° Fahrenheit. When in actual fires or tests, the temperature is reached at which the material was manufactured, the surfaces exposed to the heat become soft, then plastic and if the temperature is maintained, the construction weakens until it fails. This was substantially what occurred in the case of the end-construction hard-burned clay arch which was tested side by side with a Portland cement concrete arch at 68th street and Avenue A, New York City, on Nov. 19, 1897.

Careful inquiry and observation extending over a considerable period of time justify the belief that temperatures of 1,900° to 2,250° Fahrenheit are frequently developed in actual conflagrations. This opinion is based on the fact that copper wire has been fused in a number of instances representing a temperature of about 2,000° Fahrenheit. In exposed positions, where the conditions were favorable to produce high temperatures, such as, for example, in the neighborhood of elevator shafts, stairway wells, etc., cast iron of light section and the edges of heavy castings have also been fused. These phenomena represent probable temperatures of 2,100° to 2,350° Fahrenheit.

The Building Department tests were all made in structures of common brick. Careful observers who witnessed the tests of the Roebling system and other concrete constructions, could not fail to note that large areas of the interior surfaces of the brick walls, which had been subjected to the same temperatures as the concrete flooring, had fused and turned black, the fused material having reached such a consistency that in some places it slid down, while in other places it still hung to the walls in irregular masses, varying in size from a small nut to an egg. Although temperatures of 2,450° Fahrenheit were obtained in these tests, no indication of fusing was observed on the exposed surface of the concrete arches. In the face of such conclusive evidence as to the inferiority of common brick as a fire-proofing material, is it not singular that one of the leading architects of New York City should adopt the ordinary "row-lock" brick arch construction for the new Hall of Records Building?

In order that a material may be fire-proof in the broad sense in which that term is now used, it is not only necessary that it shall successfully withstand the highest temperatures that are ever obtained in actual conflagrations, but it must also retain its strength and resist disintegration when suddenly cooled by a regulation fire stream. In addition to these requirements, it is desirable that the material shall be inexpensive, light, and that it shall not discolor plaster work.

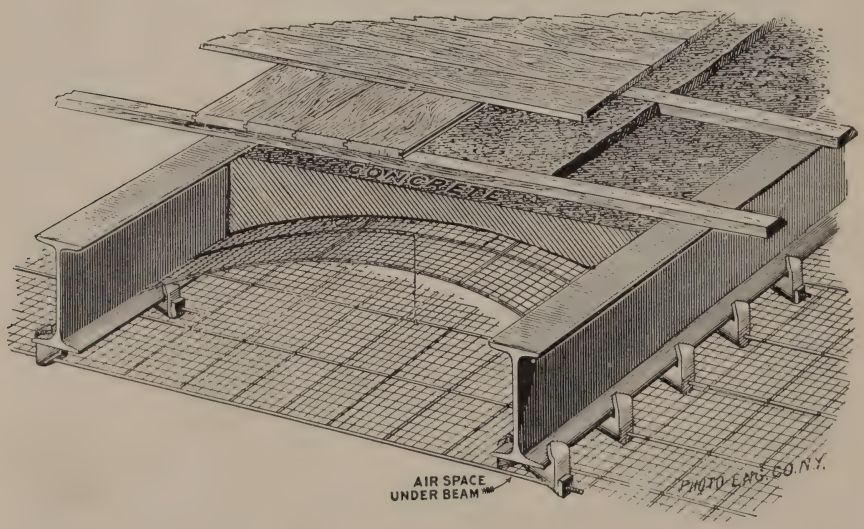
The more or less unsatisfactory manner in which the burnt clay materials fulfill the foregoing requirements, and the lack of any precise knowledge on the subject of fire-proof construction, induced one of the largest engineering and manufacturing concerns of this country, five years ago, to undertake a careful investigation of the subject. Elaborate tests, under the supervision of competent engineers, involving the expenditure of large sums of money, established the fact that concrete made from "cinder" (the residue of anthracite coal consumed in boilers), sand, and good Portland cement, fulfilled the requirements in a more satisfactory degree than any other material tested. The best and most economical method of employing the material was next considered. This subject was, for the first time, studied from a scientific standpoint and was treated exactly as any other engineering problem. Arches consisting of a number of assembled parts, either flat or segmental, were objectionable on account of the thrust and the consequent liability to settle and crack the plaster. Flat slab construction was not desirable because it developed little more than half the available strength of the material. This fact will be evident when it is explained that (a) cinder concrete is very much stronger in compression than in tension, and (b) the flat slab construction acts as a beam with the upper half of the section in compression and the lower half in tension. It is, of course, well known that the strength of a concrete slab can be very greatly increased by imbedding metal in the tension member of the section, but as that is usually the under side of the slab, it was evident (as was also subsequently shown by tests) that a hot fire would soon seriously

impair or totally destroy the strength of the metal and render it valueless as an element of the construction.

A monolithic construction in the form of a segmental arch was finally found to be the most economical and the best adapted for spanning the interval between the iron beams. In this form of construction the material is disposed so that the entire section is in compression, thus securing the maximum strength and lightness independently of metallic elements in the construction.

More important, however, than any other detail in fire-proofing a steel skeleton building is the protection of the structural iron. The massing of the fire-proofing material around the iron beams, which is so admirably realized in the monolithic segmental arch construction, secures the greatest possible protection with the available material.

Economy requires that the fire-proofing, like many other features of modern building construction, must be adapted to special requirements. These vary considerably and depend upon the character of the building. For hotels, apartment houses, office buildings, residences, etc., where the combustible material consists principally of interior finish, furniture, etc., the construction illustrated by Fig. 1



affords ample protection for the iron work, is economical in space and cost, and is especially adapted for the finest plaster finish. Plaster applied to this ceiling construction never sags or cracks and *never discolors*. These are important *desiderata* that are appreciated by architects who contemplate expensive fresco work and other elaborate ornamentation. The advantage of the continuous air space between the floor and ceiling, especially in buildings that are subdivided into a number of small rooms, has been fully established and is here properly and successfully employed.

That this construction affords ample protection against fire, was conclusively shown in the public fire and water test conducted by the New York Building Department at 81st street and West End avenue, New York City, on September 3, 1896. The duration of the fire

test was about two hours, during which a maximum temperature of 2,400° Fahrenheit was obtained and an average temperature of 2,100° maintained for over an hour. The fires were quenched and the ceiling cooled by a regulation fire stream under 60 pounds pressure. Little or no damage was caused by the fire, but the water from the fire engine washed nearly all the plaster from the ceiling. As to the condition of the floor and ceiling after the test the official report of the Superintendent of Buildings reads: "the wire in the ceiling was intact and the arches did not seem to be damaged in any way." The deflection of the iron beams after cooling was found to be less than one-fourth of an inch in a span of sixteen feet. The test indicates also the extent of the damage that may be expected from as severe a conflagration as is ever likely to occur in a hotel or office building in which this construction is used. The expense of the repairs, as shown, would be confined to renewing the wood finish and restoring the plaster.

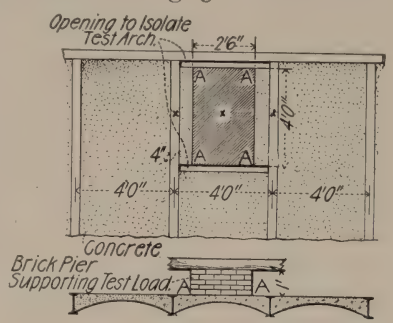
At the request of the Superintendent of Buildings, the same construction was subjected on October 28, 1896, to a five-hour fire-test, which was intended to represent an extreme case of conflagration, such as might occur in a warehouse filled with inflammable materials. The very successful result of the latter test is thus described in the official report: "The arches were in good condition. South arch steel segment rods displaced. The concrete arch proper seemed not to be affected in any way by the fire and water," etc. When it is further noted that the flat ceiling construction was omitted under the south arch referred to, and that the steel-ribbed wire centering and concrete were exposed without even plaster protection to the direct action of the flames, the above results cannot fail to prove the wonderful fire and water resisting properties of cinder concrete. The plaster and light steel flat ceiling construction under the other arches in this test remained intact for 4¾ hours, when the lacing wires having fused the wire lath and plaster fell away from the supports. In an extraordinarily severe conflagration the expense of repairing the damage as given in the case of the first test might, therefore, be slightly increased by the renewal of the light ceiling construction at such points where excessively high temperatures may be developed.

For warehouses, where great strength and economy in space and cost are desired, and for any building which may become the repository of large quantities of inflammable goods, the form of construction illustrated by Fig. 2 is recommended. The cost is considerably



reduced by dispensing with the flat ceiling, while the soffits of the beams are protected with three inches of concrete. The concrete underneath the beam being filled in at the same time as that in the arch work, insures a solid monolithic construction completely encas-

ing the iron work, and thus protects it more effectively than by any other method in use at the present time. As illustrating the adaptability of this system to warehouse construction, it may be interesting to review a strength test of a four-foot section of one of the floor arches that had withstood the five-hour fire and water test of October 28, 1896. The test was also made under the supervision of the New York Building Department. The position of the load on the arch is clearly shown by the shaded area in Fig. 3. After "shoring up" the iron beams the load sustained by the arch is officially given as follows: "Brick 38,000 pounds; stone, 2,000 pounds; planking, 550 pounds; 3 men, 450 pounds; total 41,000 pounds, distributed over an area of 10 square feet = 4,100 pounds per square foot." The arch deflected three-quarters of an inch, which was partially recovered after the removal of the load



Other modifications of this system are equally well adapted to public buildings, banks, libraries, department stores, theatres, halls of records, etc. The same system embraces also several meritorious forms of fire-proof partitions, and new and ingenious methods of suspending ceilings, furring for ornamental plaster effects, etc.

Substantial proof that the merits of this system are rapidly being recognized, is the fact that the lowest rate of insurance ever allowed on a fire-proof building in New York City, has been written for one of the large office buildings in which this system of fire-proofing has been installed.

There are also many advantages in erecting this construction that will appeal to the practical architect and builder. The material being dumped and mixed in the cellar as needed, bulky piles of material are conveniently dispensed with. The permanent wire centering erected alway in advance of the concreting, enables the work to progress continuously. It also acts as a safeguard, having saved the lives of many workmen who have fallen on it from aloft. The practical details of erecting the work have been reduced to a system insuring the greatest rapidity as well as the best results. All fire-proof construction erected according to this system, including the concrete, is furnished by the John A. Roebling's Sons Company, and is fully guaranteed. The responsibility and business reputation of this company enables it to undertake the largest contracts and fulfill all its obligations to the entire satisfaction of architects and general contractors.

The architect who desires to secure for his client the best and most economical construction, and who cannot devote the necessary time and expense to thoroughly study and investigate the subject of fire-proofing, will do well to discriminate against inferior materials and those constructions that are largely in the experimental state, or which contain elements of questionable utility when subjected to the crucial test, and adopt that which has been tested and tried and found to meet the most searching and exacting requirements.

CONVENIENCE AND SANITATION IN SCHOOL CONSTRUCTION.

THE first consideration in the erection of school buildings is, and must always be, perfect sanitation—the second, economy in construction. The utilization, therefore, of such appliances as effect a saving of floor space (for economy in area certainly means economy in construction), and are at the same time superior from a sanitary standpoint, is of the most intense interest to architects and school authorities.

In this connection, the adoption by one city alone of over two hundred ventilated wardrobes, made by the Flexible Door and Shutter Company, is significant.

It has been a difficult matter to devise ways and means for the proper ventilation of the clothing of pupils, the lack of which ventilation is so often the cause of the spread of contagious diseases, and to properly air and dry the outer garments during the school session; a solution of the problem seems, however, to be presented by this interesting device.

The wardrobe, 15 feet long by 2 feet 3 inches deep, placed in a school hallway against the wall provides ample cloak room for 56 pupils. A strong wire screen, attached to a framework, to which shelves and hooks are secured, provides an air space 4 or 5 inches deep at the back; near the middle of this air chamber, or at one end is an opening in the wall of sufficient area to connect with the nearest ventilating flue. The heat from the steam risers, placed back of the screen in the wardrobe, draws the air from the hallways in and through the wardrobes, at the same time airing, warming and drying the clothing in cold or wet weather. Economy of space is an important feature in this new convenience, saving the floor areas usually taken up by cloak rooms, thereby lessening materially the cost of construction. In practical use the ventilated wardrobe has now fully demonstrated all the strong features claimed for it and has received the indorsement and support of authorities in school construction wherever they are in use. Of their practicability Principal Frank L. Greene, of Brooklyn Grammar School No. 9, writes:

"The twelve (12) Ventilating Wardrobes closed with Flexifold doors in daily use in P. S. No. 9, this city, continue to give good satisfaction and effect a marked saving in floor areas and do away with the usual cloak rooms.

"The ventilating scheme is simple and effective, and in use, with the aid of monitors, we find them convenient."

The use of the flexifold door in the construction of the ventilating wardrobe is only one of the many applications of the flexifold partition. By the use of the same principle of construction the Flexible Door & Shutter Company have succeeded in making a partition capable of closing even the largest openings. Such an one is used to divide the Assembly Hall in the Catholic Institute at Valley Falls, R. I. Its dimensions are 48 feet wide by 11 feet 6 inches in height.

It will be easily seen how not only is convenience catered to by the device, but how also a marked saving of heat is effected. These vertical rolling partitions, operated without springs or weights, are constructed of wood moulding 1½ inches wide, hinged together with a continuous and wholly concealed interlocking steel connection, so devised and inserted into and through the wood moulding as to make the door or partition vertically rigid, while their simplicity permits the entire door or partition to be easily taken apart and put together again in case of injury or accident. In operation an even action is obtained, impossible to any vertical partition operated by springs. A simple gear that engages with cog pins on the top of the mouldings and is connected with a helical reel makes the tension even at all points, giving a smooth running action to all widths of doors.

For the subdivision of large assembly rooms in school buildings into recitation rooms, or for the subdivision of lecture or class rooms in Sunday schools as occasion may require, economizing floor areas and obviating the necessity of heating the unused portions of such large spaces, such partitions come into strong favor, while the fact that they are practically sound proof adds to their practicability for this use. Their adoption by architects, as well as church and school authorities and the excellent service they are already doing in hundreds of modern buildings in all sections of the United States, subdividing or filling wider openings than ever before attempted, attests the superiority of their principle and construction. The offices of this company are at 74 Fifth avenue, New York City. Their factories are at Bloomsburg, Pa.

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THE MAIRIES OF PARIS.

ALTHOUGH Paris is divided, for administrative purposes, into twenty wards, it is in reality only one single township. But while the Hôtel de Ville, or City Hall, is the municipal center, the local mairie of each ward is the place looked upon more particularly by the inhabitants as their town hall. It is this mairie which keeps track of the Parisian from his birth to his burial, receiving him when he enters the world, recording the most momentous and decisive acts of his life, and accompanying him finally to his last resting place. It is the mairie which intervenes at the citizen's civil and military majority, and it is the mairie which ties his marriage knot. The mairie is in truth—to use the expression of a municipal councillor of Paris, M. Paul Strauss—our social headquarters, the administrative domicil of all the inhabitants of one same zone. This of itself would suffice to give the mairie great importance; but this is not all. The mairie is not merely an office for the registration of births, marriages and deaths. Many other things, of a very varied character, come within its province. Its sphere of action and influence is largely extended by the fact that the mayor is, ex-officio, President of the Board of Charity, of the School Committee, of the Health Committee, etc. Mairies, therefore, serve a double purpose. They are places for ceremonies, and they are administrative establishments. A perfect mairie is one which can be utilized for holding grand ceremonies, and which is at the same time thoroughly adapted to suit the convenience of the officials and of the citizens.

This fact seems at length to have been grasped by the powers that be. It is not so very long since our mairies were mere hovels, built of common materials and poorly decorated in a commonplace fashion, or not even decorated at all. In those days fine edifices were built only for the aristocracy. But this is now entirely changed. Quite a transformation has taken place in the building art—a trans-



FIG. I.

formation characteristic of our epoch. Instead of a few scattered châteaux, there are springing up whole streets, in fact whole districts, of elegant houses combining everything that modern ideas of comfort and modern taste can suggest. It is evident that the mairie was bound to symbolize this transformation, for it expresses in a manner the wealth and power of a community of private individuals taking the place of the isolated luxury of a few grandees. From this point of view alone it is an example of the present stage of the building art that is well worth studying.

The mairies of Paris certainly do not resemble one another. They do not sin by a servile uniformity, and although most of them are without a history, they all have their distinctive features, their own particular stamp. We have the convent-like mairie, such as that situated on the Place du Louvre, which M. Pierre Véron called "the double-headed calf in freestone." We have the barrack-like mairie in the rue de la Banque; the bastion-like mairie at Batignolles, and the temple-like mairie with Grecian portico, facing the Pantheon. We have above all the labyrinth-like mairie, where one ascends, descends and wanders round and round without ever finding the office one seeks or the functionary one has come to see. It is needless to say that this article will not deal with any of those mairies. We will say, however, in passing, and this remark, which has been made specially about the Hôtel de Ville, applies in general to nearly all the twenty mairies of Paris—that the majority of our town halls are ill-adapted for offices, which is the purpose they are chiefly intended to serve. The corridors and staircases are too large, and the rooms too small. We have searched among the newly-constructed mairies for those which are best suited to modern requirements, and most fully respond to the double purpose mentioned above—the holding of gatherings, and the convenient transaction of official business. We have chosen the mairie of the Sixteenth Ward and that of the Tenth Ward, adding thereto the town hall of Neuilly-sur-Seine, which is located at the very gates of Paris. We have noted the characteristic features of each of these three structures, so as to enable American architects to form an idea of the manner in which French architects treat this kind of edifice, and even, if necessary, to use them as a guide for the erection of a typical town hall.

The Nueilly mairie (No. 1) is built on a broad avenue. It stands at the bottom of a square of medium size bordered on the right by a block of school buildings, and on the left by elegant private houses. The mairie is detached on all sides. Some general information about the building and the materials employed has been given to us by M. Dutocq, chief architect of the edifice. The soil on which the mairie stands is a compact chalky sand of excellent consistence for building upon. A bed of concrete 60 centimeters deep supports the walls

of the cellars, which are built of millstone grit. For the cellar story, dressed stone has been used only for the summers which bear the arches supporting the walls of the story above. The cellars are excavated 2m. 30 below the level of the public road, and rise 1m. 70 above this level, thus forming a fine basement floor, perfectly ventilated. Their walls, in millstone grit as we have said, are crowned by a plain string course in freestone, marking the level of the ground floor all round. A facing of choice stone, placed slopingly, covers the rough stone wall up to the string course. Above the latter rises the ground floor, the wall of which is based on a stone socle one meter in height. The finest and most durable stones to be found in France have been used for the principal front, for the grand staircase and for all the first story. The inner walls are of hard rubble, and the distributions of Vaugirard bricks. The top story is similar in construction. The entire framework—floors and roof—is in iron. The campanile consists of cast iron. It is built upon two main girders one meter high which support a framework composed of cast iron columns with iron cross-pieces, serving, at the height of the attics, as a base for the campanile. The back staircases are constructed of sheet-iron and angle-iron, the steps being of plain hard stone. They are thus proof against all risk of fire. The roof is covered with slates; the gutters are in lead, but the little terraces of the garrets and wings, as well as the oriels, are in zinc.

The facade of the mairie of Neuilly-sur-Seine is 40 meters wide. The wings have a frontage of 13 meters. A broad flight of steps leads up to the level of the ground floor. The latter is 7 m. 50 high, and the floor above it measures 9 meters high. Above that, the attics rise to a height of 8 meters from their base. Lastly, the cast-iron bell tower, crowning all, is 42 meters high, measured from the street level to the summit of the cupola.

The most striking feature of the facade is the strong contrast between the three arcades which pierce the ground floor and the seven openings on the first story. The three ground-floor arcades are separated from each other by substantial pilasters which support with ease the intercolumniation of the story above. This opening, uniformly repeated seven times, in contrast with the sober piercing of the ground floor, gives fineness and elegance to the upper part of the edifice. The Corinthian order which dominates the composition of this floor is exceedingly effective. It supports an attic, above which the clock tower rises upon a base extending the width of the three central intercolumniations of the story beneath. The central part of the clock is supported by two circular frontons serving as seats for two reclining figures representing: on the left, the Duties, and on the other side, the Rights, of citizens. The central dial is framed by two standing female figures representing Night and Day, while above



FIG. 2.

this part of the clock an attic with fronton is surmounted by two children bending forward and holding an escutcheon. All the statuary just described is the work of M. Tony Noël, a clever sculptor who certainly has a talent for ornamentation. The only reproach we have to bring against M. Tony Noël is that he has not imparted sufficient character to his figures and has not differentiated the symbol of the Rights from that of the Duties, and the image of Night from that of Day.

Descending from the summit of the edifice, the eye falls on the Corinthian frieze, composed of festoons and children, from the chisel of that eminent sculptor, M. Barrias. Further down, we would call attention to the key-stones of the arcades on the ground floor, which are pleasantly conceived and executed.

Let us now pass to the forepart of the building. Foreparts are necessarily similar in arrangement to the central part, and the frieze contains another piece of work by M. Barrias, he having been asked to depict above the large windows, Charity, Economy, Study and Justice (Fig. 2) in the form of recumbent figures. The available space, perpendicularly, was very limited, but the sculptor has happily overcome this difficulty. Finally, on the lower portion of these foreparts, escutcheons ornamented with festoons of flowers and fruits are accompanied by young men and maidens writing and reading various devices. It is true that a few reminiscences of the past are met with in this facade of the mairie, but they do not jar too much on us, being adapted to modern requirements with a preciseness and fidelity which are quite up to date. A specially striking feature is the happy harmony between the architecture in its main lines and the sculpture, brightened and vivified, of the new school of artists. An interesting parallel might be drawn between the tendencies of these two arts—architecture and sculpture—which, receiving their inspiration at the outset from some ancient school, free themselves thereform by degrees and introduce elements of a very marked "modernism"—elements which are, perhaps, the forerunners of a new Renaissance.

We have said that the cellar floor of this mairie forms a fine, well-ventilated basement. In the center thereof is a large cellar for storing coal. On each side of this is a large hot-air stove. On the right are cellars, storerooms, a prison for men and another for women; and on the left, the choral society's room, a cloak-room, a muniment room, etc. The entrance vestibule on the ground floor (No. 3) is sober, but not without a certain grandeur. The lamps, however, are commonplace to the last degree, and produce an unsightly effect. We are also astonished at the group on the left in this vestibule, representing a man of wild aspect engaged in fighting a lion. What on earth has such a group to do in a town hall? Is it there to incite the peaceable citizens of Neuilly to become savages, or is it intended to teach them the way to wrestle with the mighty king of beasts, in case an animal of this species should escape from a menagerie in the fair which is held hard by every summer? This kind of symbolism is certainly inscrutable to us. We will say the same regarding the amazing statue on the central staircase (No. 4). Why do we find at such a spot this example of the nude—a nudity aggravated by an air of tipsiness? Why was it not remembered that



FIG. 3.

engaged couples pass up this staircase on their way to the room where marriages are solemnized? Every part of a public building ought to contribute to the beauty and harmony thereof. An ill-chosen or misplaced motive is capable of spoiling the whole thing.



FIG. 4

This is a recognized truth, and yet how few of our artists in general, and our architects in particular, take it into account!

The illustrations here presented absolve us from giving a detailed description of the interior of this edifice. We will merely remark that the departments which have the most to do with others are grouped together, as also are those which deal more specially with the public. The fire brigade department, the state tax office, the town dues office, the municipal tax office, the office charged with relieving the poor, the office of the doctor attached to the department of civil status, the police office and the policemen's quarters, occupy the ground floor. On the entresol we find the private room of the chief officer of civil status, the registry of births, the registry of



FIG. 5.

deaths, the office of the controller of the land survey, the general funeral undertaking office, the town architect's office, the streets and roads department, etc. All these premises are spacious, well lighted and easy of access.

The first floor is devoted to those departments which are connected with the holding of meetings and ceremonies of various kinds. The visitor is admirably prepared for the splendor of the rooms set apart for festive gatherings, the town council meetings, etc., by the sight of the magnificent landing (No. 5) upon which those chambers open. We have here a decorative conception exceedingly elegant as a whole, and of remarkable execution. It is even too fine, we think, for the rooms beyond turn out to be less splendid than one is led to expect after passing through such a magnificent ante-chamber. The

private office of the mayor, the town clerk's office, the committee room and the deputy-mayor's office cannot be found fault with, for these rooms may be regarded as reserved for work and study, and we well understand that the architect was not called on to decorate them in an elaborate fashion. But we have a right to be more fastidious respecting the three grand halls for ceremonies, viz., the hall in which marriages are celebrated, the great public hall and the council chamber, and we have all the more reason to expect something fine when the landing which leads to these halls is so superb. What should we say of a princely park whose sumptuous avenues led to a small hovel? In the same way, the three principal chambers in the Neuilly town hall disappoint us by their mediocrity. The Salle des



FIG. 6.

Mariages (No. 6) is so poor in decoration, so miserably ornamented, that it would perhaps be cruel to dwell on the point. We will not dwell on it—we will even carry our charity so far as to pretend that the bas-relief representing the Family, which we see above the fireplace, is as beautiful and artistic as it is morally elevating. Nor will we dwell on the large salon d'honneur (No. 7), but simply call the reader's attention to the fireplace, above which stands a bust of the Republic. This fireplace is a perfect model of what a fireplace ought not to be. It is not only ugly, but vain. It is not provided with a chimney, and consequently no fire can be made there. It is a make-believe, and this make-believe, instead of pleasing the eye, shocks and irritates it. And to think that this fireplace was inspired by the fireplaces of the old Hôtel de Ville of Paris! Yet the latter were su-



FIG. 7.

perb, which proves again that a thing is only beautiful in its exact proportions and its right place. As to the council chamber, we have abstained from having it photographed. We should not have a single word to say about this apartment if we did not recall to mind Alfred de Mussét's passage:

. . . . Nu comme un mur d'église,
Nu comme le discours d'un académicien.

Let us be just, however. We must remember that the architect was allowed only a limited sum of money, as can be seen from the following list, in which figures the total expense of erecting the mairie of Neuilly-sur-Seine:

Earthwork	13,700	francs.
Masonry	643,000	"
Iron framework	152,500	"
Wood framework	25,500	"
Roofing and leadwork	72,500	"
Woodwork	68,000	"
Locksmith's work	25,000	"
Chimney work	27,000	"
Marble and mosaic work	27,800	"
Painting, glazing and wall hangings	38,000	"
Sculpture	140,000	"
Clock	4,500	"
Lightning conductors and ironmongery of an artistic character	30,500	"
Decoration of the Grand Hall, including chandeliers, etc	50,000	"
Provisional furnishing and sundries	71,794	"
Total	1,389,794	francs.

To this sum must be added 69,490 francs for architects' fees, being at the rate of 5 per cent. on the cost, which brings up the total expense to 1,459,284 francs, or about 1,216 francs per superficial meter built upon. For such a price as this we must not expect too much; besides, we have only to consider the parts of the edifice that are treated in an artistic and intelligent manner. In commencing its description we dealt with its main front. Its posterior facade (No. 8), which gives upon a lawn, is simple, but very graceful. We find a quiet eloquence in that statue of Parmentier (the man who introduced potatoes into France), surrounded by flowers, roses and potatoes. The useful is thus mingled with the beautiful. The architect who succeeds in reconciling these two terms will be a great architect, and will give us an ideal mairie.

The town hall of the 16th Arrondissement is far from being one of the finest in Paris, and it is by no means the most commodious.

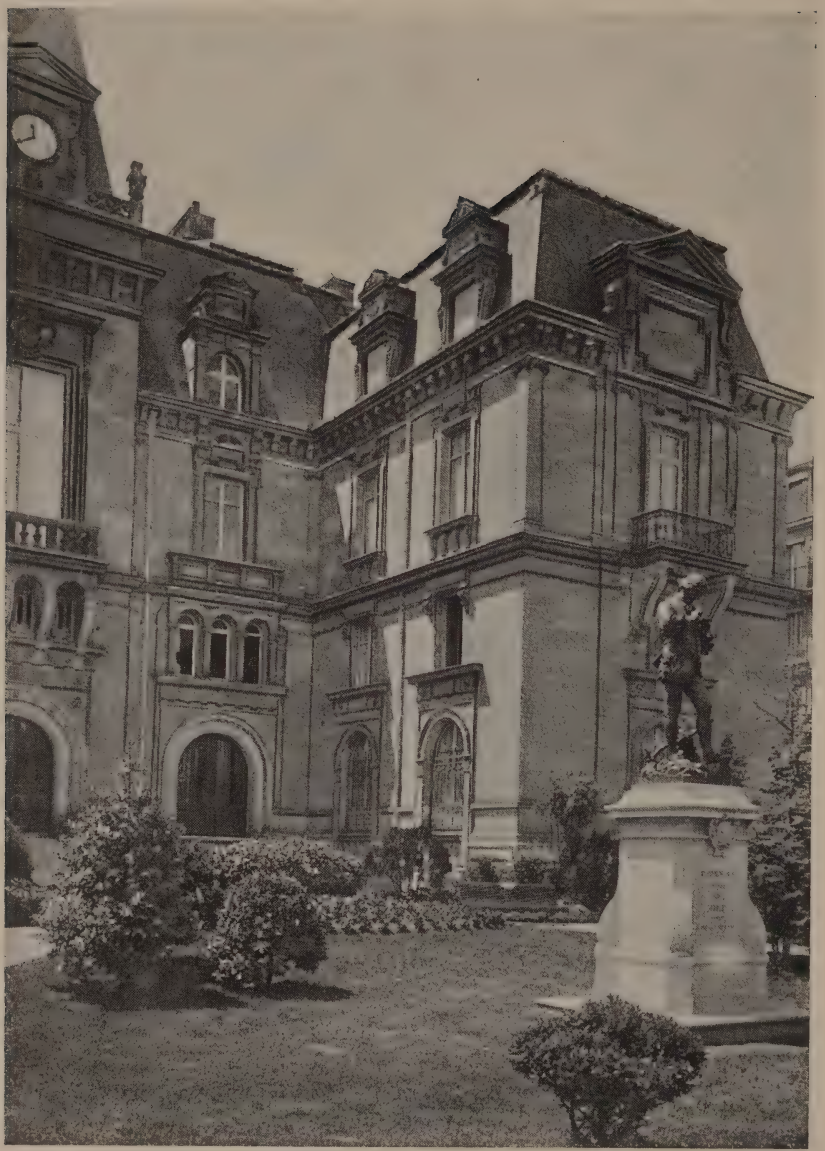


FIG. 8.

The reader will doubtless recall those nursery tales in which the good fairy who is present at the birth of a baby endows it with all kinds of sublime qualities; then comes a wicked magician who, by imparting one bad trait, destroys all the amiable features bestowed by the good fairy. Well, one would suppose that two architects had been entrusted with the erection of the mairie of the Sixteenth Ward; that the first of them had drawn magnificent plans, but that



FIG. 9.

the other came and destroyed them, or what is perhaps still worse, spoiled them. The vestibule of this mairie (No. 9) is spacious, well-ventilated and light. It gives access to a large central courtyard. Around this courtyard, on four sides, rise all the various departments. Our No. 10 represents a part of one of these faces. The arrangement is very good; it would seem to allow of the different offices being grouped in a logical and convenient manner. We are compelled to say, however, that this result has not been attained. The offices are difficult of access to the last degree. The rooms destined for the holding of ceremonies and entertainments are so commonplace that, far from inspiring gaiety, which it is their purpose to do, they make the visitor positively sad. In all this vast building there is nothing

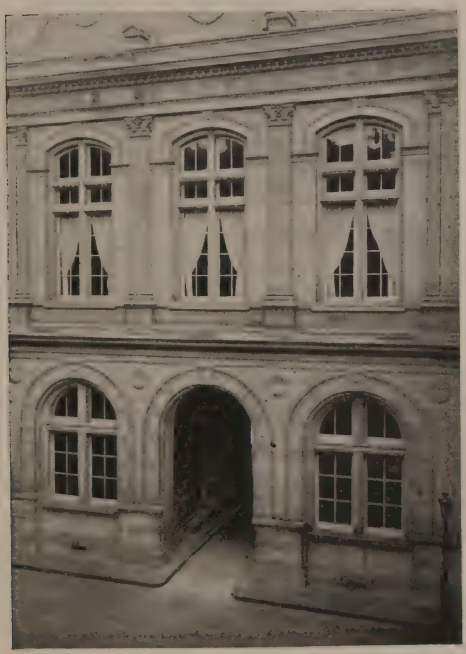


FIG. 10.



FIG. 11.

that can be called convenient except the stairs and the corridors. The architect must have been endowed with great taste in the matter of staircases and corridors, and so, having a talent in this direction, he has introduced them everywhere, with a zeal and a tenacity truly astonishing. He has managed, however, to arrange for sufficient space for a hall intended for educational purposes (No. 11). This hall, which has a glazed roof, is distinctly handsome. The children sit in rows in the body of the hall; the teacher stands on the small platform at the far end, beneath the head of the Republic, and the little gallery provides room for the parents who wish to be pres-



FIG. 12.



FIG. 13.

ent at the lessons. Most of the town halls of Paris lack such a school-room, so that this room alone is sufficient to render the mairie of the Sixteenth Ward worthy of notice.

We come now to the mairie of the Tenth Ward. This town hall was inaugurated last year (1896), and is therefore of recent construction. Its principal architect is M. Rouyer, but he was largely aided in his task by MM. Mayeux and Roulet. The great difficulty the architect had to overcome arose from the irregularity of the ground upon which the edifice had to be built. The principal frontage, on the rue du Faubourg Saint-Martin, was sloping. M. Rouyer cleverly got over this by a curvilinear arrangement of his inner vestibule, forming as it were the knee-cap of the broken principal axis. He has made a distinct block of the buildings on the main face, which are occupied by special departments (on the ground floor, the room for marriages and the mayor's cabinet; on the second, the chief clerk's offices); and he has connected this block with the mairie properly called by masking, by a hemicycle opening on the large inner hall, the obtuse angle



FIG. 14.

formed by the slope of the ground. This large inner hall is surrounded by arcades and is very remarkable. It is a sort of Italian cortile covered in the French fashion. We reproduce it here from three different points, viz.: from the ground floor, showing an angle of the entresol and first floor (No. 12); from the first floor, showing the upper part of the edifice (No. 13), and a view of the under part of the staircase on the ground floor (No. 14). Around this large hall, which, as is seen, rises from the ground to the top of the building and is covered by a glazed roof, are located all the divers departments, carefully grouped. On the ground floor,



FIG. 20.

the parts where it joins the side faces). On entering the mairie, one perceives, through three large arcades: in the center, the grand staircase, extending into the hall, with its porticos; the impression is certainly excellent. At close sight the staircase is not so harmonious as it appeared at the first glance. We understand that there was a question of putting a landing in the middle of the first flight. We regret that this plan was not carried out: we regret it not only on account of the effect, but from the point of view of comfort and convenience. We will mention an interesting detail. This staircase is



FIG. 21.

entirely in stucco and its skeleton all in steel. The galleries of the hall also have a metallic skeleton (piers in riveted iron, connected by fillets or beams trellised) roughly pugged with bricks and plaster, rough-coated with stucco. This is quite new—at all events in France—so new, in fact, that the intransigeants of architectonic rationalism jump with indignation at the mere mention of this method of producing something solid and of good appearance at a small cost. But the general public has already shown its appreciation of the result obtained by the architect of this mairie.

On the entresol of the first floor are the architect's offices and the committee rooms. On the attic story are the engineers' offices, the rooms of the treasurer of the Poor Fund, and, above the Entertainment Hall, the municipal library. The top story provides place for



FIG. 22.

various other departments of lesser importance. All along the offices, on each floor, runs a wide gallery paved with glass, which goes round the large hall. On every floor this gallery rounds off, on the right of the facade, in a large hemicycle with columns, thus masking the want of symmetry caused by the irregular shape of the ground.

So much for the location of the various sections. As regards the external appearance of the edifice, we will say that it is sumptuous. The ground floor of the main face, the semi-circular arcades of which are closed by forged-iron gates, the engaged columns which, on the ground floor, separate the large square windows divided by mull-

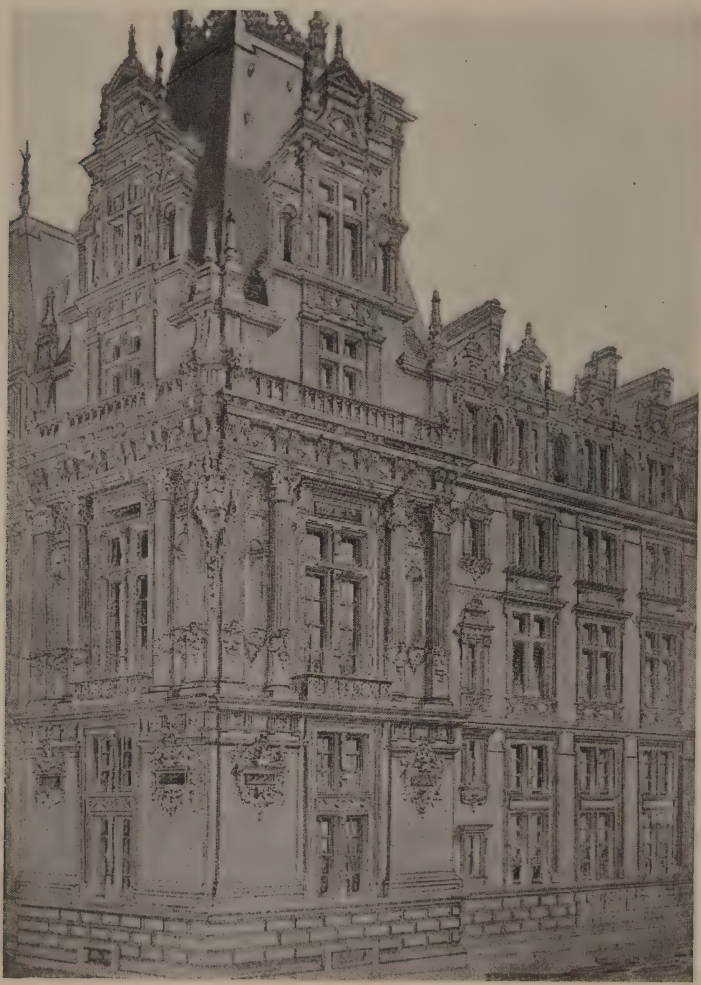


FIG. 23.

ions, the elegant cornice surmounting the first floor, the balcony with open-worked balusters which runs above the cornice, the fine, sober pinnacles which rise above the windows of the second floor under the high roof with its light bell tower—all this is inspired by the most delicate Renaissance motives. In No. 23 we give the corner of the principle facade on the rue Château d'Eau. If we do not dwell further on this exterior, it is because the architect has manifestly had in mind

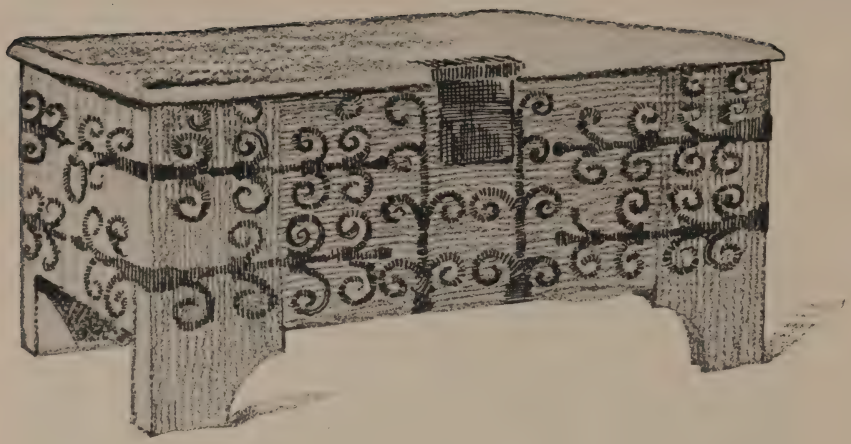
the former Paris Hôtel de Ville and has done little more than produce a reduction thereof. We admit that this copy on a smaller scale is ingenious and seductive, and that it is full of pleasing, brilliant and picturesque details (No. 24); we admit, too, that all the capitals and cartouches are replete with grace, and we are delighted with the motive former under the campanile by the clock, above which a cock in relief is flapping his wings.



FIG. 24.

It may perhaps be thought that in an article intended to point out the most interesting models of French town hall we have indulged rather too freely in criticism. If so, we hope we shall be excused for having thought that it is not enough merely to show what ought to be done, but that it is also needful to show from time to time what ought not to be done.

Fernand Mazade.



THE EVOLUTION OF FURNITURE.

FOR a brief study of the development of furniture we need not begin our search at a period as early as the Greeks or Romans. We have but to recall the condition of Europe at the time of the fall of the Roman Empire to remember that all civilization was general confusion; that there was no social or domestic life. Consequently, furniture, in the sense which we use the term to-day, was almost unknown.

It was in the tenth century that the feudal system first developed itself, and it is this period that we may take as a starting point for a research concerning domestic furniture.

At this time home life was of such an unsettled character that household effects were reduced to their lowest terms.

The most important article of furniture was the chest, packing box, trunk, or strong box in which household possessions were placed either for safe keeping or for transportation. The chest was of so much importance, and played such a prominent part among early furniture, that it has been said to be the piece from which all others evolved. This is much too broad a statement, and not at all true; yet the chest was used as a substitute, on occasion, for many articles of furniture known to-day. Moreover, the form was introduced into every article where possible.

Feudal chiefs moved incessantly from one stronghold to another, taking their belongings with them, and it was this that gave rise to the general use of chests in which property could be transported. On arriving at a resting place, the contents, consisting largely of draperies, bedding, and clothing, were removed from the chests, which were not then stored away out of sight, but were arranged against the walls, or elsewhere, to serve as seats and wardrobes.

The gentleman of this period had no closet, except his trunk, in which to place his clothes. The chest was found in all houses, those of the poor as well as the rich; in the courts, and the church, where it was used to hold valuables and vestments.

At first it was a little more than a strong box, resting directly on the floor, and having a strong lock. It was made of boards, roughly framed together, and bound with iron, sometimes richly forged. As these chests were always in sight, a desire to have them handsome arose, and they were ornamented with painting, which was less likely to be injured when the chest was moved than would carving or relief ornament. Carving of wood was very little practiced at an early date, and painting in different colors was the usual form of decora-



Swing-back bench having chest seat. XV. Century.

tion. It is interesting to note that when carving was first used, it was only the panels sunk below the level of the rail and somewhat protected that were ornamented. This carving, too, was in low relief. The domestic use of the chest was as a seat, and cushions were placed on the top to make it comfortable, for chairs, as articles for daily use, were not known to Europeans until the first half of the fourteenth century.

Benches or settles were used prior to this, and it is quite probable many of these were chests. At all events, we know that at that date chests were provided with a panel back, and arms at the ends. They were thus converted into benches, the common form of seat. It was

the bench that replaced the triclinium of the ancients, when, during the Byzantine period, the custom of reclining at meals ceased; and the term banquets is derived from bancs or benches, thus used. The usual location for the bench-chest was before the fire or against the wall. When used before the fire the swing-back was introduced, enabling the occupant to either face the fire or sit with his back toward it. The paneled back of benches was sometimes quite high and served as a protection from the cold draughts of the large rooms; as did the rude wooden high-backed settle of our ancestors in this country.



High-back bench with a chest seat. XVI. Century.

Thus far we have considered these seats as long, rectangular boxes, but the cubical, or nearly cubical, form was also used; particularly after the introduction of the arms and back. In this form the back was almost invariably high and straight, making the chair of the fourteenth century. These were usually placed at the bedside, where the box forming the lower part was used as a receptacle for various articles; in later days for devotional books, the chair serving as prie-dieu.

When the canopy was added to the high back of the chair just described, it became a large, heavy article of furniture, much too cumbersome to move about the room. This canopy we sometimes see to-day, over the seat of public officials or speakers, where it is an emblem of dignity, as it was during the Middle Ages. Such chairs were not common; there was usually but one, or at the most two, in a house. Its great weight and clumsiness soon made it unpopular, and this, together with the introduction of more suitable seats, caused it to go out of use. When the chest was richly carved and no longer used as a packing box for travelers, smaller boxes for clothing only taking their place, they were found inconvenient for the storage of various articles, as the things most wanted were always at the bottom, and to get at them everything else had to be removed.



Chair with chest seat. XV. Century.

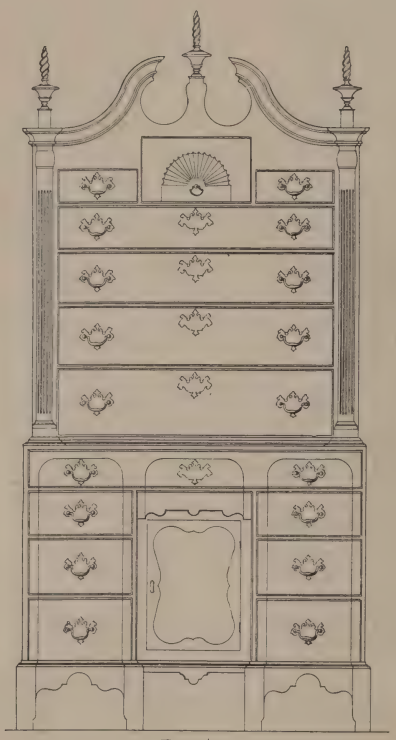
This led to the invention of the drawer, and we read of chests with one, two and three drawers; also chests of drawers. These latter were much used during the eighteenth century.

It does not seem clear which was used first, the chest all drawers or the chest with one drawer. The former were, during the seventeenth century, made low and used as dressing tables, with a small movable glass placed on the top. This was the beginning of the bureau, as we call it, though there were several changes before the article of furniture we know as such was made.

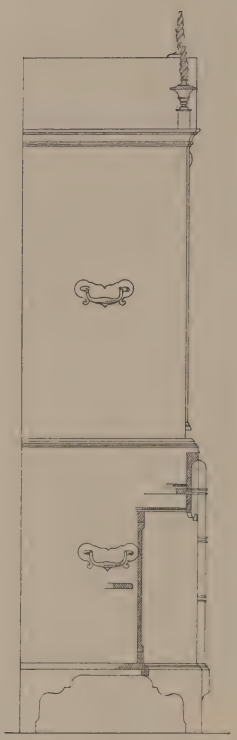
The chest of drawers was raised and placed on a table or another case of drawers, making what was possibly the precursor of the chiffonnier. There usually accompanied this high chest of drawers a six-legged table, with drawers, on which the dressing box and mirror was placed, the whole making a dressing table.

A closet or cupboard fastened against the wall is not very different from a chest turned on end. The first closets were like this.

High-boy.
Double chest of drawers.



Front.



Side and partial section.

Scale 0 1 2 3 feet.

DOUBLE CHEST OF DRAWERS.

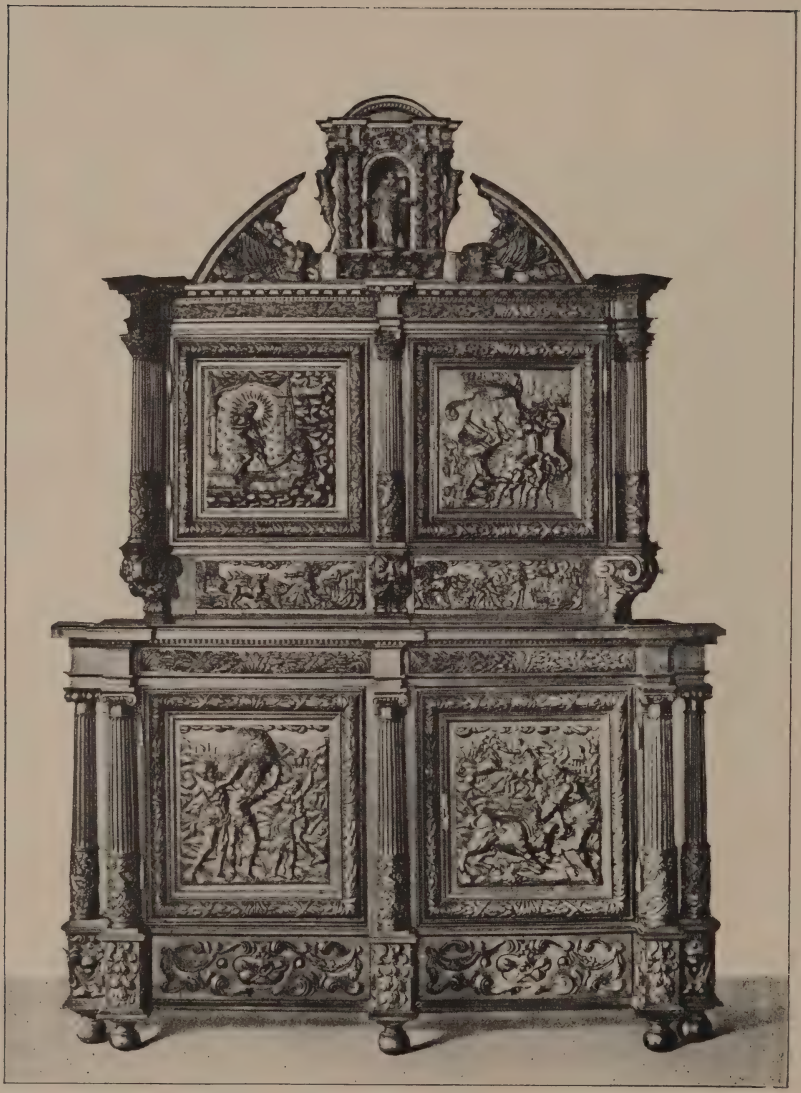
They were not built in the house, but placed against the walls of the room; sometimes they were fastened on the wall, clear of the floor. Their form was governed by the use to which they were put, which, during the Middle Ages, was to hold clothing and almost anything of value. They were sometimes placed in a special room and numbered or lettered, as we do lockers in club houses and gymnasiums. This cupboard or wardrobe remained a massive rectangular box, roughly made and put together, though, like the chest, it was sometimes painted to improve the looks, until near the end of the fourteenth century, when the methods of construction were improved. The sides were then framed, paneled, and mouldings more or less rich were introduced. Later, the panels were carved, simply at first in imitation of a sheet of parchment folded, followed by arabesques, and grotesques in low relief. The number of doors and shape depended on circumstances. A not unusual form was that of a rectangular box, somewhat higher than wide, divided into three parts, the upper and lower parts consisting of cupboards, while the third, a narrow middle section, comprised one drawer; or, possibly, two small drawers on the same level.



Wardrobe. XIII. or XIV. Century.

During the sixteenth century it retained this same form, but the locks and hinges, which previously were large, ornamental and visible, no longer showed. The whole affair became much more architectural in appearance. Columns, niches, cornices, pediments pilasters, and richly carved panels were introduced. It was also somewhat smaller than the one which preceded and followed it.

During the seventeenth century it became extremely large and lost its elegant appearance, though it was elaborated and grew in popular favor until found in nearly every house. Its great size then led to a reaction, and the other extreme was reached. In France, it



CABINET. XVI. CENTURY.

became a piece of furniture, about three feet high, no longer a place for clothing, but a richly decorated article mounted with brass ornaments and a marble top. There was often but a single door (sometimes two), and it held within silverware, china, books, and such articles as we to-day place in a cabinet.

Later, the cupboard assumed its original rôle as a place for clothing and stood in the bedroom or dressing rooms. Its high rectangular form was restored, but not its beauty. There was sometimes



Cabinet, Louis XIV.

one, sometimes two doors nearly its full height, and these were paneled with wood or the panels replaced by a mirror. Such is the wardrobe familiar to us all.

An article closely allied, that is in appearance, with the cabinet is the bookcase. The first bookcase we read of was a chest in which books could be locked and transported, for they were scarce and valuable. When printing was introduced and the number of books increased, it was natural enough to keep them in the cupboards just

described. The step from them to the cases as now made is slight, though the term bookcase was not used till the beginning of the eighteenth century. During the seventeenth century books in public libraries were placed on double reading desks, to which they were chained, and those who wished to consult them passed from table to table.

The sideboard is directly the outcome of two early articles of furniture; the credence, and dresser. The former was, perhaps, essentially what it is now, an ecclesiastical article of furniture, but is was also used in the houses. It consisted of a small closet on long legs. In this closet were kept wines and goblets, and over its top was spread a cloth, on which the decanters and glasses were set when wine was served. At a later period a series of steps or stages were placed on the top for the purpose of showing off the silverware and dishes. At first it was very simple in character, but became more and more elegant until it was finally elaborately ornamented with metal work, carving and a canopy.

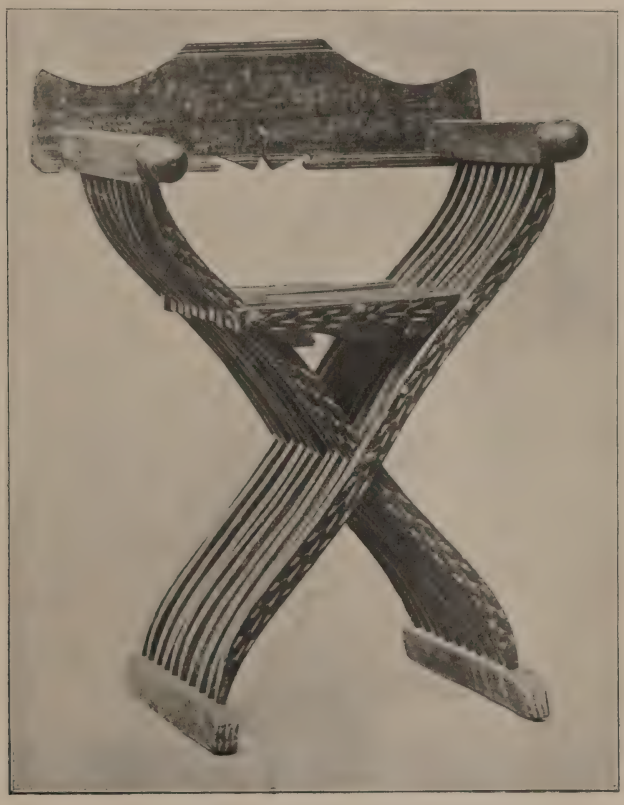


Dresser, XV. Century.

The dresser began service in the kitchen as a table, advancing until it was composed of a top and two shelves below, supported by four legs. It was then used not so much as a place for dressing the meats as a serving table on which the dishes were placed before being allotted to the members of the household. At a later period a portion of the dresser became enclosed, and after that an extra shelf with sometimes a hood were placed on it. It was then not an article of the kitchen furniture, but stood in the hall or living room. As a result of the desire to reduce the quantity of furniture in the hall the credence and dresser were combined as one article with a closet and shelf below, and several shelves above, the whole surmounted by a canopy. Then it was like some of our sideboards, though it was not known by that name until the eighteenth century,

when it assumed the long, low table form with drawers and cupboards below. The name sideboard prior to this had, however, been applied to tables as early as the sixteenth century.

The earliest chair of the Middle Ages was not a domestic seat, but a throne for ceremonial occasions. When a chief received his people or assemblies he occupied a seat as a mark of dignity. As there were times when he visited his lands somewhat removed from the



Folding chair. XV. Century.

castle, and desired to have his throne with him, it was constructed so as to be easily carried about.

A relic of the time of the Roman Empire was found to suit the purpose admirably; that is, a folding seat, without arms or back. This seat, often of metal, richly ornamented, was quite high, a footstool being used in connection with it. Such was the early throne, and it was used as such only. Though originally made to fold, as soon as there was no necessity for moving it from place to place it was made heavier and rigid. The general shape and appearance remained the same, though a back was added, and the sides raised

so as to form arms, making what we now sometimes term the "scissor" chair. This, together with the high back, chest seat previously mentioned, was, perhaps, the only form of chair prior to the sixteenth century. Both were arm chairs and equally seats of honor; emblems of dignity. The throne was the seat occupied by the ruler on audience days, and no one else was permitted to sit except on a stool or a cushion.

The lords, and others of rank, imitated the rulers by having arm chairs, like the thrones, for their especial use at home. These seem to have been of the "scissor" pattern, as it was lighter and more easily moved than the chest-chair. Chairs of any kind were rare, however. In the principal apartment there was usually but one, a place of honor reserved for the head of the family or the guest of distinction. In addition to this, as a place to sit, were found only benches, chests, stools, and cushions. In the bedroom was also a single chair and benches.

After the arm chair was made smaller it gradually came into more common use. Then for a time there seems to have been no other kind of chair used; all had arms until a change in the style of dress among women caused a transformation. It was found that the wide spreading dress with hoops interfered with the ladies using the arm chair; consequently it became fashionable to have chairs made without arms. When the hoop-skirt went out of style arm chairs were again used in the houses, but they were larger, wider between the arms, and more comfortable. It was also sumptuously upholstered —previously the cushions were loose—and considered the most noble of all seats. Upholstered chairs were found warm in summer and were replaced by chairs with cane or rush seats, loose cushions being used when desired. The constructive parts of these chairs, the legs, slats, back, etc., were of lathe work, and, as a result of the rush seat, were made smaller and lighter.

But turned work did not remain popular with the rich for any length of time, and the more substantial forms came into use again. In the second half of the seventeenth century the arm chair was a common seat, because of its ease and comfort, though it was still a seat of honor. Havard's "Dictionnaire de l'ameublement," quotes from a book of etiquette, published in Paris, in 1673, containing this rule: If a person of quality make you a visit, it is necessary to give him the arm chair, and take a more modest seat yourself. When the hoop-skirt came into use for a second time the arm chair had become such a popular seat that it could not be discarded entirely, but was adapted to the circumstances. The arms, instead of extending to the front edge of the seat, were shortened and moved back, so as not to interfere with the dresses, as we see in the French chairs of the time of Louis XIV.

When the bench was used to sit on during meals we find it was much too heavy to move up to the table as we do with our chairs, instead the table was moved up to the seat. The table was a rectangular board set on wooden horses, and it remained subsidiary to the seat until the sixteenth century. In early times the diners did not sit face to face on opposite sides of the table, but together on the same side. This left the other free for service. Later, when both sides

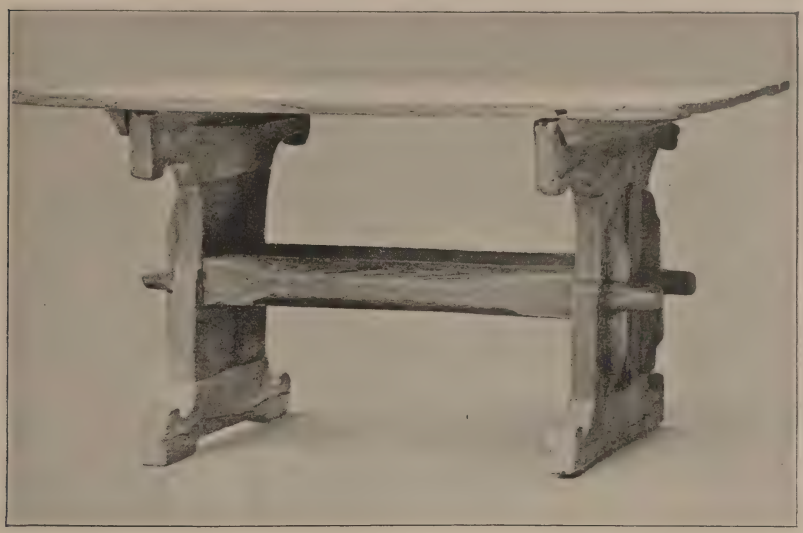


Table. XV. Century.

of the table were used, it was necessary that seats of a portable character be provided for those who sat opposite the benches. As these people were of a lower social scale than those sitting on the benches, they occupied stools, though there was also a practical reason for using these, they being the only portable seat, chairs not having been invented. Those sitting on the benches could not readily move in or out after the table was in place. In leaving the table at the end of the repast those left first who sat on the stools, which were then removed by servants, and the tables were next taken down, enabling those sitting on the benches to rise.

Folding chairs took the place of benches and stools, while the table was but a temporary affair removed at the end of the dinner. It was not till the eighteenth century that the dining room with a fixed table and chairs standing about was introduced.

Presumably the bedstead has always been used as such from the beginning, though custom has caused many changes in its shape and the manner of decorating it. Yet, what it always has been is a frame to hold a mattress on which the sleeper can lie.

The chest and the bench were used to sleep on at times, but we

cannot call them bedsteads any more than we can the floor, which was where the mattress for sleeping was placed for a long time. On the other hand, there were bedsteads that had the portion beneath the mattress built as a chest for the express use as such.

In the peasant house of early times there was always an enormous bedstead, on which the man, his wife, his children, and even the stranger who asked for hospitality could easily rest. The habit of sharing the bed with the guest was not confined to the lower classes.



Bedstead. XVI. Century.

Royalty followed, perhaps established, the custom. The guest at a chateau could not receive any greater honor than to occupy the same bed as the lord of the manor.

During the fourteenth century nearly every manor house had three kinds of bedsteads. First, the bedstead used by the lord on special state occasions. This was the best, highest, largest, and most elegant. Great care was taken of it. Second, a smaller bed, suited to the person who used it, was the everyday bedstead where the lord usually slept. Third, the trundle bed which was very low, narrow,

and on casters. This was used by the valet. It was rolled into the sleeping room of the master at night and removed in the morning, or it was made to roll under the larger bedstead. This trundle bed was used only by the chosen servant; the others slept either on the floor or wherever they had a chance. The woodwork of the bedstead was made as simple as possible, which was a great contrast with the decorations of the rooms. To avoid this marked difference they were hung with curtains of the same material that was used on the walls, entirely hiding the framework of the bedstead itself.

Prior to the sixteenth century all bedsteads had the mattress supported on cords or straps attached to the framework. Some time about the beginning of that century a change was made by introducing a separate frame that could be taken out of the bedstead, and to this the straps were nailed. As a result the bedstead became more portable, particularly as the framework was, about the same time, fastened together with screws in place of the mortise and tenons previously used. At the same time the desire for more richly decorated bedsteads increased until we find them inlaid, silvered, and gilded.

Till the sixteenth century the tester or canopy was an independent affair, hung from the ceiling of the room and not attached to the bedstead at all. It was then joined to the bedstead by four uprights, giving rise to the high post bedstead which was elaborated in an extensive way until a reaction took place, when the framework was again simplified and covered up so it was hardly seen at all.

The hangings played an important part of the decoration of the bedstead, and the woodwork did not again come into prominence until mahogany was extensively used. Then the head, footboards and sides of the bedstead attained a size not previously reached. To-day the same forms are used, but they are not so heavy or elaborate as formerly.

From the end of the fifteenth century until the last century bedsteads were so high that each one was provided with steps alongside to enable a person to get in or out.

Alvan C. Nye



ANGEL WITH SCROLL.

Cartoon for Decorative Painting, from the Original in the possession of Mr. C. Fairfax Murray.

THE ART OF WILLIAM MORRIS*.

THESE books contain the record of one of the busiest lives which even this toiling century has seen. The amount of work produced by William Morris, when thought of in its entirety, is simply incredible, and in nothing is this book more valuable than in arraying in some order the records that exist of this extraordinary mass of achievement. Dissatisfied with the dead level of mediocrity into which modern decorative art had fallen and feeling that, in England, at least, there was practically no decorative art, Morris set himself, from an early point in his student life, to find out the secret of happier times, and to see whether any revival of old art was possible. Brought up against an impenetrable wall of impossibilities in the matter of architectural sculpture and of Gothic architecture in its essential nature; feeling keenly the disappointment of his hopes in this direction, as will be explained below, but perfectly aware that there was absolutely nothing to be done to restore Gothic architecture as he and John Ruskin understood it, he lost no heart and no hope and attacked the mystery of the past along other lines. He taught himself wood-engraving in the ancient way, not by learning wood-engraving in a modern shop and then trying to engrave as the XV. century Italian had done, but by cutting blocks himself, after the minutest study of the impressions in old books from the lost wood blocks of the Great Time. His power of analysis was great, and his power of close application unbounded. He would study the prints from old wood-cuts with a devotion of which few men are capable, and with a patience which nothing could weary. So he made himself a wood-engraver, and, in like manner, he taught himself the art of illumination by copying the pages of ancient manuscripts, not as a young woman copies them when she paints mottoes to hang on the Sunday-school wall, with the conviction that she can improve on the XIV. century originals and need take from them only their suggestions—but with the conviction that the old illuminators knew and that he, Morris, did not know yet what decorative design in the adornment of a book really was. He taught himself

*The Art of William Morris: A Record. By Aymar Vallance; with Reproductions from Designs and Fabrics Printed in the Colors of the Originals; Examples of the Type and Ornaments used at the Kelmscott Press; and many other Illustrations; also a Classified Bibliography by Temple Scott. Printed at the Chiswick Press and published by George Bell & Sons. Folio, pp. XI., 167, XXX.; 49 plates, of which many are in colors and illustrations in the text. London, MDCCCXCVII. New York: Chas. Scribner's Sons, Importers.

William Morris, His Art, His Writings and His Public Life: A Record by Aymer Vallance; pp. XVI., 462; 34 plates and many illustrations. London: George Bell & Sons, 1897. New York: The Macmillan Co.

weaving and he taught himself wood-carving; he taught himself tapestry working; and he and his assistants taught each other the true secrets of embroidery. He worked out the mystery of carpet weaving of the true Oriental sort; he studied the art of dyeing and began to dye his own wools and his own silks as soon as he had satisfied himself that no well-dyed material could be bought in the market. The firm of Morris, Marshall, Faulkner & Co., and that of Morris & Co. which succeeded it and took over its business, undertook the manufacture of stained glass, of hand-painted tiles, of wall papers, of printed calicoes, of printed velveteen (a specialty), of woven fabrics of extraordinary richness, like brocaded velvet, and elaborate combinations of silk and gold, and, also, of cheaper fabrics; of tapestries made in the genuine way with the high or upright loom; of carpets of the "Kidderminster" make, and others with deep pile; and of embroidery, domestic and ecclesiastical. That he might know how all these things should be made, and in order that the old system of patient, slow, tranquil handwork might be regained, he practised every one of these arts himself, and, indeed, he seems never to have set an employee to work until he could show him how to go to work and how to do so much of his work that advance and improvement would be easy. There were cases, no doubt, when the workman became Morris's fellow-worker and grew as successful as he, or even more thoroughly at home in the work than he, with his many occupations, but there is no case in which Morris was not for much in the actual handiwork undertaken in the orders of the firm except in the matter of furniture. The firm of Morris & Co. made furniture, plain as well as rich, and always on the lines of realistic design studied from that of the Middle Ages; but we are told that this department was never undertaken by Morris himself, whose specialty was flat decoration.

Specimens of this flat-pattern designing are given in the illustrations to this article. It would be unfair to judge Morris's power of designing wholly from these small scale cuts. And yet they suffice to show how mediaeval in character are most of the patterns and also how slight was the designer's power over the human form. It has been asserted frequently that a knowledge of the figure must precede all successful drawing of ornament. This is a hard saying and its general truth can scarcely be maintained, but the limitations as a draughtsman, which two of these cuts make evident, told seriously against Morris's success in the matter of floral and foliated design.

Between 1861 and 1896 this work went on incessantly, the number of employees constantly growing as the demands for the firm's productions increased, and at no time did Morris cease to give minute and almost daily attention to the many handicrafts which were being carried on at once, and all of them, it is to be observed, in ways



VELVET BROCHÉ WITH GOLD TISSUE.

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wholly apart and differing widely, from the methods pursued in the trades generally. If there is any exception to this rule it is, perhaps, in the matter of stained glass, for in that, the processes followed by Morris's firm could not have differed greatly from the processes employed by the better class of English makers and workers of decorative glass. In most of the operations carried on by the firm, the rigid exclusion of machine-work and the insistence on ancient methods, so far as they could be discovered, the use, revived for the occasion, of the ancient looms and frames, and the deliberate choice of perfect workmanship above rapid production, made the



ANGELS IN ADORATION.
Cartoon for Wall Decoration, in the possession of Mr. C. Fairfax Murray.

direction of this many-sided manufacturing house work enough for one man. So far, however, from considering it work enough for him, Morris made very many elaborate colored drawings as designs for the workmen, and he was never without the employment furnished him by his studies in illumination. These he carried out even to the extent of copying with his own hands several volumes of his own composition and the "Rubaiyat of Omar Khayyam," and beginning the transcription of Virgil's "Aeneid"—the Latin text—which, indeed, he seems to have half completed. These were generally prepared as gifts for friends, as to the wife of Edward Burne-Jones, the painter, and his close ally. In like manner he designed almost wholly by himself

and drew almost wholly with his own hand the immense number of initial letters and the very considerable number of title pages and page borders included in the many publications of the Kelmscott Press. Nor need we remind the draughtsman that such a mass of published design presupposes the existence of very many drawings which have never been used, their exact place never having been found for them during Morris's life; nor does our biographer, Mr. Vallance, fail to tell us something about these separate drawings and their present whereabouts. Here was avocation enough for a man even less busy than Morris with his manufacturing house. But there is also to consider Morris the poet, Morris the writer of socialistic romances, Morris the active worker, as lecturer and organizer of societies wherever there seemed to be hope for a reconstruction of the good old times of decorative art, and Morris, the active and convinced socialist, working at the propaganda to which he turned his thoughts during the last twenty years of his life.

As poet, although the volume called "The Defence of Guenevere and Other Poems" appeared in 1858, yet his chief work was done between 1865 and 1885. These twenty years witnessed either the completion or the publication of the "Life and Death of Jason," a long epic-like narrative in seventeen books, "The Earthly Paradise," of which the four parts appeared during the years 1868 to 1870; "Love is Enough, or the Fleeing of Pharamond," published in 1873, a translation of the "Aeneid" of Virgil, in 1875, "The Story of Sigurd the Volsung" and "The Fall of the Niblungs," 1877, and many shorter poems, published in periodicals and afterwards brought together in volumes, such as the very recently issued "Poems by the Way." It is not intended here to offer connected criticism of these numerous poems. Opinions, even of sincere lovers of poetry will always differ greatly as to the value of this long series of narratives in smooth and pleasant verse. The naive exclamations of surprise with which Mr. Vallance greets any unfavorable criticism which he has to record, and the comparison he gives us of less unfavorable critical articles taken from English reviews, show at once how great was the divergence, at the time of their publication, among English opinions. No doubt American critical judgment would be more nearly uniform, if the poems were much read in this country, for there would not be here the controversial spirit excited by Morris's position as a member of a much admired and much abused party in art, and as one at first suspected, afterwards convicted of revolutionary socialism. Still, even in America, there will remain irreconcilable differences between those who think the story of "Jason" or that of "The Man born to be King" a simple and forcible narrative charmingly told in truly poetical form and those who find the same poem full of affectations, while they consider many of the other narratives of the same

epoch inferior to these two and too tedious to be read more than once. Mr. Vallance is aware that many English critics think that the rugged savagery of the ballads in the Defence of Guenevere was replaced in after years by something not nearly so good. The word "ballad" which has slipped into the last sentence suggests an explanation of these differences of opinion. There are those to whom the old Border Ballad is really valuable poetry; and there are those to whom it is interesting as a piece of folk-lore and as one chapter in the history of the evolution of poetry. Many of the stories in "The Earthly Paradise" are really ballads with the true ballad simplicity and also with what Matthew Arnold calls "the true ballad-manner. . . .I was going to say the true ballad-slang."

As worker in the cause of true decorative art, as he understood it, Morris was all that a powerful theorist joined to a practical and constant worker could be. He lectured, he wrote for publication and for private influence over men of his circle; he was never at rest. The Arts' and Crafts' Exhibition Society alone would account for a good part of the life-work of a less untiring man than Morris. He seems, indeed, to have been made without that tendency to grow weary which most men suffer from. It was not that after a busy day's work he could enjoy himself in occupations of the most fatiguing kind, designing, composing, creating, giving out incessantly—drawing in black and white and in color in a serious and workmanlike way all the evening, or writing verse and prose worthy of publication and sure to command readers—it is not merely that he passed week after week and month after month in a steady round of such absorbing occupations as these, but that as the years went by, he did not change in his steady occupation or lose his grip on the work in hand.

As for his work as an active socialist, that must be left uncriticized here even more completely than the poetry. Mingled with the socialistic propaganda to which he devoted himself very earnestly from 1884 until his death, there is the interesting subject of his romances embodying dreams of the future. In the opinion of the present writer "News from Nowhere" is a story vastly superior in interest and a vision vastly superior in fascination to the stories which are popular and are selling by thousands, and to the visions which these stories embody. "A Dream of John Ball" is probably a more masterly performance even than the other, being shorter, more strictly a work of art, less in danger of being thought too synoptical and too descriptive. It seems that at last, in these later days, Morris's life was found too small to contain all that he tried to crowd into it, and that his practical decorative work had to give way to the claims of the socialistic movement; the societies of which he had become a member, and, alas, their incessant quarrels.

Whether his life was cut short by undue application, whether, in

short, he was overworked, does not appear certain. What is certain is that he did more than one man's work in his life of sixty-two years.

The guiding principle of Morris's life of dealings with fine art was the importance of unhurried, uncommercial handwork. Ruskin's celebrated chapter in the second volume of the "Stones of Venice," entitled "The Nature of Gothic," was, from the time of its publication in 1853, a hand-book for those who were trying to bring about the Gothic Revival. It is, of course, entirely inadequate as accounting for Gothic architecture, for, indeed, the constructional part—which is the essential part of the style—was absolutely unsuspected by the writer, then only thirty-four years old, and wholly without other knowledge of building than his observations as a traveller had supplied him with. In one thing, however, it was most able, most original, most profound; it pointed out the radical difference between the work of the mediaeval sculptors and that of the sculptors of some other school. The statement is not wholly fair as regards the Greek or the Egyptian. It may be well assured that there was less subserviency in the workmen than Ruskin, never free from partisanship in his argument, had assumed. But the interest of the thirteenth century work was clearly and rightly seen by Ruskin. The fashion in which the thirteenth century sculptor, unversed in anatomy, incapable of producing a work of sculpturesque excellence, as incompetent to produce a statue like one by Paul de Bois, as a statue like one by Praxiteles, yet found a way to express his sense of beauty, his feeling for form and composition, his gift at the decorative combination of many statues and many figures in relief in one artistic whole, without in any way shocking the spectator, either of his time or of ours by his lack of knowledge of the human form—all that and the admirable effect inevitably wrought upon the workman by the trust in him and the opportunity given him to work out his own artistic thought without the check of the superior science interrupt-



WALL-PAPER.
Specially designed for St. James' Palace.

ing and saying that his art was useless unless it could be scientifically accurate and elaborate in sculpturesque design—all that better condition of the mediaeval workman was admirably seized by Ruskin and expressed in his usual glowing and highly wrought prose. This chapter served as a sort of handbook for the would-be Gothic Revivalist, and nothing in Mr. Vallance's book is more interesting than his account of Morris's grievous disappointment when he found that these, indeed, were the facts, and that unless those social conditions could be reconstructed Gothic sculpture was out of the reach of the modern workman and, therefore, Gothic architecture out of the reach of the modern world. "To William Morris architecture was at once the basis and crowning point of every other art, the standard by which all the rest must be dominated and appraised." This sentence we take from page 9 of Mr. Vallance's larger book, and there follows this, what is really a sad chapter of disappointment which records the conviction of Morris and his associates that nothing could be done in Gothic architecture and that even their chosen champion, George Edmund Street, was going all to pieces in his "Neo-XIII. Century Platitudes": "More particularly his largest and most conspicuous performance, the Courts of Justice in Fleet Street." The assumption that architecture is the essential art without which the other fine and decorative arts can hardly flourish, joined with the conviction that architecture as he cared for it was impossible in England in the XIX. century, might have been supposed to check Morris in his enthusiasm and turn his thoughts in another direction. But this was not to be. Disregarding the warnings of his own spirit, he decided that he could still become a decorative artist in ceramic wares, in textiles, in printing and in coloring, and that he could teach others what true decoration was in many ways. In other words, he was too resolute in his will to re-create ornamental art, as it had been understood in old times, to listen to the warning of his own instinct which told him that without architecture this was impossible. Accordingly he set to work. He was only twenty-three when he had around him "a company of ladies" who "used to meet at the study in Red Lion Square and while he was doing decoration in oil color, they, under his superintendence, embroidered hangings for the adornment of his future home." This was just before his marriage and "the future home" was the Red House at Upton, near Bexley Heath, in Kent. Philip Webb was the architect of this house which is noted here as "remarkable as being the first example of the artistic use of revived red brick for domestic purposes for its time, a bold innovation." The decoration of the Red House seems to have been very primitive, the walls being tinted "with pale distemper and the ceilings ornamented by simple scrolls in yellow on white."



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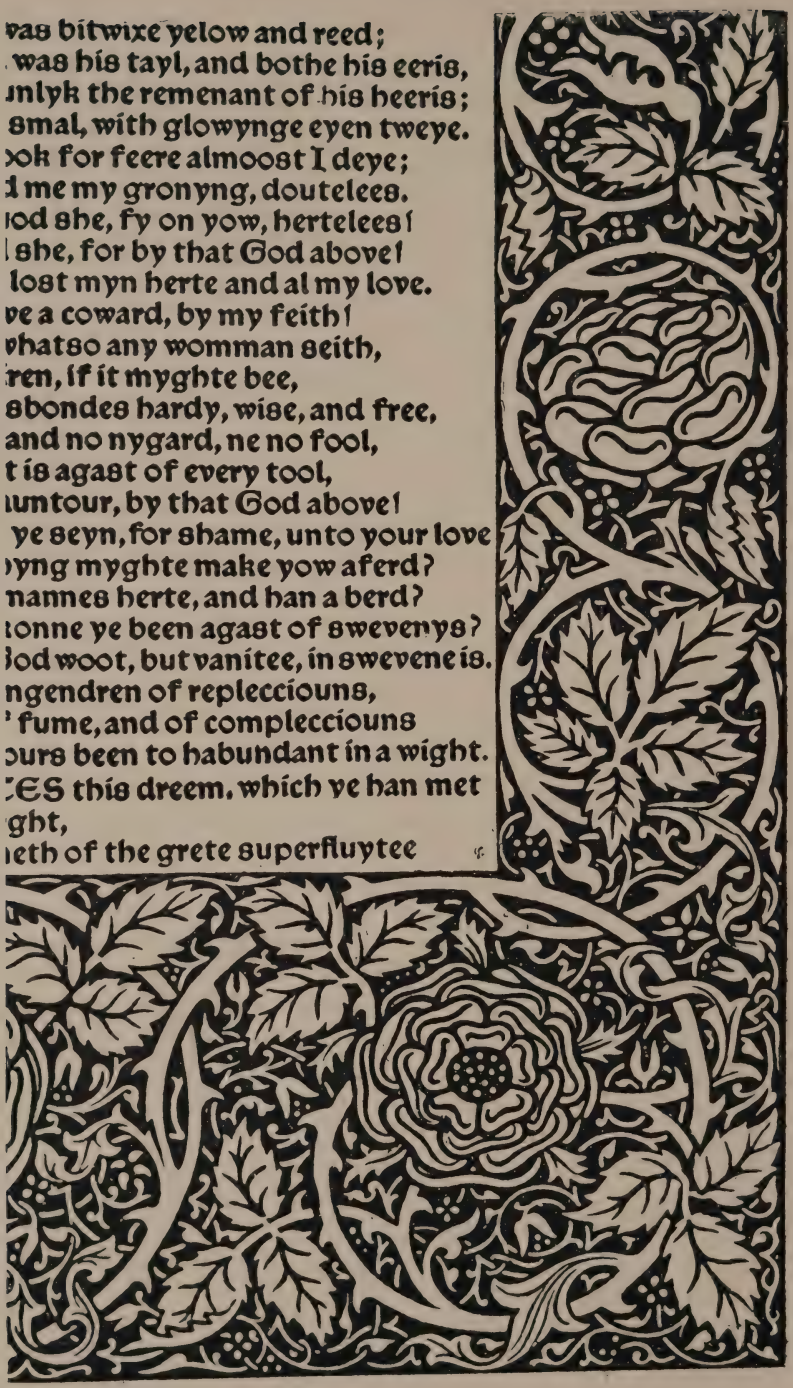
CHINTZ.—THE HONEYSUCKLE DESIGN.

The firm of Morris, Marshall, Faulkner & Company was founded in 1861 and in that firm were associated Morris and his architect, Webb, the four pre-Raphaelite painters, Ford Madox Brown, Dante Gabriel Rossetti, Arthur Hughes and Edward Burne-Jones. There were also "Peter Paul Marshall, District Surveyor at Tottenham, and Engineer; and Charles Joseph Faulkner, an Oxford Don." We know nothing and hear nothing of these two last named members of the firm, although their names were the only ones included in the firm name. Private letters from London, of 1864, describe the work already done and doing by the firm as being chiefly stained glass, though some painted cabinets had been extraordinarily successful. This matter of furniture, richly painted in all of its parts in the early mediaeval rather than a true Gothic fashion, and with Southern rather than French or English wealth of detail, is, perhaps, traceable to Burne-Jones, but was taken up by others, and the London dwelling house of William Burges contained an escritoire in the dining-room, a bookcase in the library, a settle in the hall, a wardrobe in the guest-chamber, another in Burges's own bed-room, a bookcase in the "armoury," a wardrobe in the "day nursery" and a piece called "the dog cabinet," all of which pieces of furniture were covered with brilliant decoration in color in minute patterns, enclosing and setting off paintings by artists who were friends of the designer Burges. The fashion, however, so far as XIX. century England is concerned, must be traced back to the Red House and to the pieces which, whether designed by Burne-Jones or by Morris, stood there as types of what it was thought furniture should be.

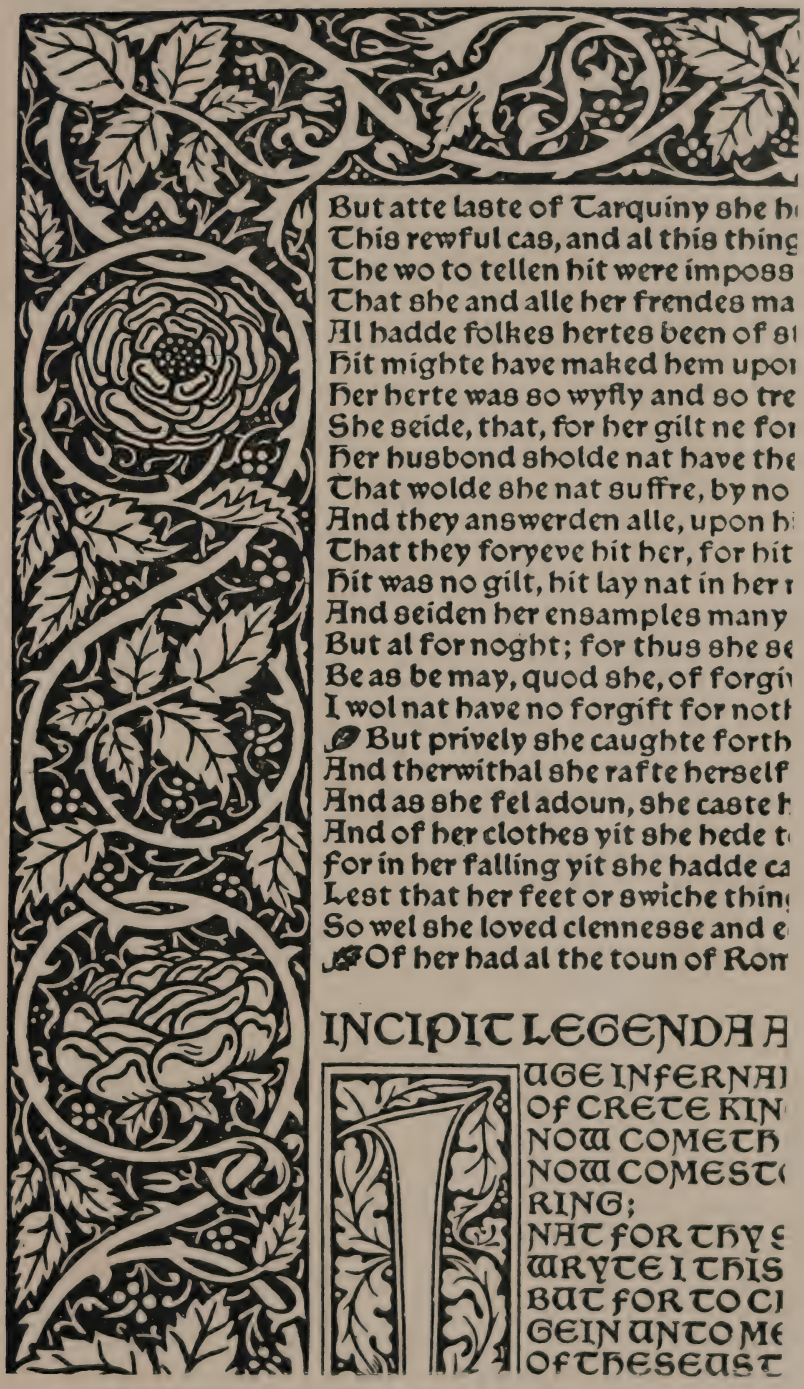
The Exhibition of 1862 contained several important contributions from the new firm, of which panels and windows of stained glass formed a large part, and one important unit was a cabinet made for J. P. Seddon, the architect. The great three volume publication devoted by the government to recording the Exhibition of 1862 contains a large colored print of this cabinet which is approximately worthy as a record of its design and the richness of its adornment. The paintings were by Ford Madox Brown and Burne-Jones and illustrated an imaginary honeymoon of King René of Provence, and these paintings covered the panels, which are painted like easel pictures, completely into their corner; but the frame of the cabinet is of polished oak inlaid with different colored woods. Another cabinet in the same Exhibition was painted by Morris, but of this little seems to be known. It is spoken of as being now in private ownership.

That which is most easy for the world at large to see and to study of all of William Morris's decorative designing is the book-work done by him, or under his direction. The Kelmscott Press was not established until 1891, but before that Morris, who had always in-

terested himself in illumination and decorative writing, and who had frequently designed and seen carried out delicate work in binding and in printing and in illustrating books, had also made a most minute study of "The Ideal Book," its pages of letter-press as well as its illustrations. To our enthusiastic student it was a matter of importance that the proportions between letter-press and margins, and among the four margins of a page and the eight margins of the two opposite pages should all be carefully weighed. As for the typography itself, it does not appear that he ever had type cut for his own work until 1890, but then the three alphabets known to those who have examined the Kelmscott Books were designed and cut. Of these, two are in the modified and more intelligible Gothic style suggested, indeed, by the script of the XIV. century, but not affectedly unintelligible. These two were called at a later time from the names of books first printed in them, the Troy and the Chaucer fonts; a third, the Golden font, was a modification of the earlier Italian type, that is to say, it was what we call a Roman alphabet. A few wood-cuts of pictorial subject decorate the forty-five books which were produced at the Kelmscott Press, but these were, perhaps, invariably drawn by others, chiefly by Sir Edward Burne-Jones. Of these it is not necessary to speak here. The decorative side was almost entirely carried out by Morris himself, and everyone of the Kelmscott books is crowded with initial letters, and most of them are drawn with borders and title pages of considerable display. Some few of the larger books have title pages and other pages made rich by borders two or three inches wide, and, again, some have the whole surface of the page covered with carefully worked scroll patterns upon which the letters are relieved. Mr. Vallance's book includes a reprint of two pages of the great Chaucer, published in 1896, and in these is shown a double border of roses with their leaves and briary stems, within which the text contains nine small and two large and brilliant initial letters, marking the beginnings of the main divisions of the Canterbury Tales. This is not the most attractive, nor should it be called the most successful of the decorative pages of the "Chaucer," but it serves well as an example of the whole. The title page of "Hand and Soul," by Dante Gabriel Rossetti, and that of the tale of "Over Sea," are given as specimens of the octavo size small quartos; the first page of Poems by the Way is given as a specimen of books of next larger size; the title page of "Godefrey of Boloyne" serves to show how the smaller folios are decorated, the Chaucer being larger still and much the largest of all. Of these, the "Godfrey of Boloyne" is certainly the finest design. The contrast of red and black was sparingly used, some of the books having none of it, others having it carried freely through the whole body of the work like no ancient books that occur



KELMSCOTT PRESS: DETAIL FROM THE "CHAUCER."



KELMSCOTT PRESS: DETAIL FROM THE "CHAUCER."

to the memory except some of the Processionals—the small volumes which seem to have been carried by chanting priests as they walked and sang and which, therefore, had need of every device to catch the eye and aid the singer in keeping his place. It is probably a sign of good taste and a certain reserve, that this method of adornment is not more freely used. Certainly it is not the question of expense which prevented its freer use, because there are books which have marginal notes only in red with the body in black; and, indeed, the high price of the books and their appeal to a very limited and wealthy class of book buyers precludes this consideration.

The question how meritorious are the designs which appear as being by William Morris is a hard question to answer until the relation of his work to other modern designing has been considered. All modern designing for the flat surface which is worthy of the name is based upon a very considerable knowledge—or, of what has been called, Science—that is to say, of skilled or instructed draughtmanship. All designing for relief, or for the round, has been based upon much gained knowledge of form and on skill in modelling. The only designs which have any value as manifestations of the modern spirit or embodiment of modern feeling are the work of very able and very highly trained men. It is as true now as it was when Morris and his associates discovered it forty years ago, that the way in which the thirteenth century sculptor worked—the way in which the Chinese decorator of porcelain used to work—the way in which the Hindoo carpet-weaver used to work before the English spoiled his trade—the way in which the Scandinavian wood-carver could work in the tenth century—is no longer open before us. The modern workman having no other instruction than that of the schools and of the shop where he has learned his trade, knows nothing of design, nor of how to approach it; he has no knowledge of how to begin a design, for all his training leads him the other way, that is, towards a careful carrying out of another man's design. This is equally true whether he has artistic work to do or the wholly undecorative work of the machine-shop. Locomotive and piece of decorative furniture alike have to be made on the principle of close following of drawings, to deviate from which is to violate the contract and to spoil the piece of work. Now, in the days and in the countries where decorative design has been easy and plentiful, men could produce patterns in a semi-traditional, semi-original way, and it is in this manner that the Chinese painter of pottery is still able to turn out hand-painted dinner-plates at a price which defies European competition, and which are yet pleasing in design, everyone having something within its little circumference of the old and the great art of China. It was designing of that sort which culminated in the borders of the wall-paintings at Assisi, the inlaid patterns along the bands on the

flanks of the Cathedral at Florence and its bell tower. It was an Eastern culmination of such work which we find in the painted tiles of the Cairene mosques and in the borders of Persian rugs. It is very true that during the last five or six years a revival of pattern designing has begun in what seems a wholesome fashion. It is not concentrated in one place, nor is it the result of any theoretical teaching; it appears at once in France, in England, in Germany and in the United States. What that movement may come to it is yet too early to say, but apart from that, it is certainly true that all the important designing of modern times is just the reverse of pattern designing, and consists in the conventionalizing of the same forms and the same motives which less conventionalized show themselves in paintings on canvas and in sculptured groups for city monuments. In other words, the designing of the second half of the nineteenth century is nothing else than painting and sculpture acting under somewhat greater restraint than usual, nor is there yet any considerable body of good designing except that of the highly trained artist working for a decorative purpose.

Into this world which knew not true decoration stepped William Morris and, guided by the noblest of aspirations, determined to set himself counter to it and to work, not along the lines of least resistance, but to face what he had reason to believe would be the most hopeless inertia possible. He tried, as the more enthusiastic of the Gothic revivalists had tried, to take up mediaeval designing where the fourteenth century had left it, in patterns for walls and for textiles, and where the fifteenth century had left it, for book-work. As William Butterfield, Benjamin Woodward, Sir Thomas Deane and James Pritchard tried in all sincerity to take thirteenth century Gothic, English and French and to go on from that high culminating point of achievement to the further evolution which modern requirements seem to make easy; adding to the Northern forms some such modification in the way of simplicity as the Italian practice suggested together with much Italian variety of color—so Morris tried to take flat-pattern designing as the fourteenth century had left it, with a view of working out its natural results. The result in the case of the architects was complete failure in their main attempt, namely, that of bringing into use a style of architecture common, at least, to all British communities and universally recognized by those communities as the style of the time. It was also failure nearly as complete in the production of good single buildings; for although there is here and there a monument of the Gothic Revival which has architectural merit, such monuments are extremely rare, and misunderstood archaeology in copying has been the rule. How, indeed, should Gothic architecture succeed when neither its construction nor its chief means of decoration were or could be employed! In like

manner, Morris must be said to have failed altogether in his attempt to build up a modern system of design, for it is still as true as it was in 1850 that pattern designing is unknown and impossible to the European workman. It appears to the present writer that Morris has failed also as a producer of good designs. Nothing which has been offered to the public in the way of painted tiles, the work of Morris & Company, is otherwise than feeble and most of it is even worse than feeble—it is spotty and does not adapt itself well at once to near and distant view. Nothing in the way of wall-papers or printed chintzes is of exceptional merit; for although there are some really effective designs, these are wholly mediaeval in character; although there are some apparently original patterns in which the surface is well covered, these are always clumsy in drawing, and the only considerable achievement which is to be found in these patterns is the conventionalizing of natural plant forms. This, indeed, must be allowed as a considerable merit. The well known "Trellis" wall-paper in which the simulacrum of a light skeleton of laths with a rose-vine climbing upon it, and birds—which last were drawn by Philip Webb, the architect—is given in the folio volume, properly reduced in scale, in a colored plate. It does not suffer from the reduction and the reader may look at the plate, if he has not a piece of the paper within reach, and satisfy himself as to the quality of Morris's designing. This is as nearly original as any of the successful patterns, and it shows at once the strength and the weakness of the system of design employed. Morris abhorred double flowers, considering them half artificial, and seems to have made but a partial exception in favor of the garden rose. Accordingly, in the design named, the rose, though not absolutely a wild rose of the hedge, is yet so displayed as to show its open corolla and its clump of yellow anthers in the centre. The leaves, too, are all shown flat, and here comes in one of the worst faults of the design, for how a lover of plants could endure to show the five-parted rose leaves ten thousand times repeated as a flat pressed object cut out of tin, as it were is past comprehension. Immeasurably better is the Wey design for a chintz, and, also, the Wandle design and the Honeysuckle design, also for chintzes; but each and all of these is strongly mediæval in character, nor is it possible to believe that anything like the Wandle design, for instance, could ever have suggested itself to a man whose mind was not full of fourteenth century Flemish and fifteenth century Italian patterns. The carpets are even more frankly Oriental than are the wall-papers and chintzes European of the Middle Ages. Now, it is no shame to anyone that in beginning the study of carpet-making, he should produce designs of Oriental character. By all means let him begin by imitating the Orientals, always with the understanding that he is to deviate from them as soon as he can with



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ARRAS TAPESTRY. THE WOODPECKER.

safety, but so long as the designs remain visible copies, or, at most, studies of Persian and Indian patterns, so long they do not challenge our admiration as original designs. Easily, the best design shown in this folio volume, and the best design which the present writer has ever encountered as the work of Morris & Company, is the piece of real tapestry called The Woodpecker. This is very properly reproduced in the octavo volume, and a clever and spirited design it is. If Morris had produced many such things as that he would deserve to rank as a designer rather than as a student of design, which is probably the rank which the immediate future will give him.

The book work to which Morris had given so much attention during the later years of his life is not more satisfactory than the colored patterns of his earlier days. It is good to possess one or two volumes of the Kelmscott Series, but if a student has one of the simplest and one of the more elaborate, he has enough. The same spirit appears in them all, and while that partial uniformity is perfecly legitimate and familiar—for no designer can be always turning out wholly new things, and the buyer of his work should be content sometimes with agreeable modifications of a design once made—the high cost of the books make it unwise to purchase many of them if they appear to be all worked on the same lines of composition. At two or three dollars a volume one might like to possess the whole shelf full, but at ten or twenty times that price, their relative value seems inadequate. In saying this, one says also, by implication, that the books are not very beautiful. Interesting they are, unusual, frankly mediaeval in many of their appointments and appliances, but really noble designing is as rare in them as in the common-place mercantile books which Morris abhorred and against which he protested. A Christmas book with illustrations by modern artists and "decorations" by another artist, those decorations being generally frank adaptations of plant form, is much more in the modern spirit than Morris's work and will please the many who are not educated in art much more readily than Morris's work, but it is not on that account certain that the decorations of the popular gift-book are worse. They have something which Morris's work does not possess; they have grace. In fact, it is grace, it is the beauty of easy line and simple composition which Morris's book-work seems to lack. The borders are much too crowded; the scrolls are too rapid and too much involved; the leafage is too contorted and shattered; the composition is uneasy, and one finds himself comparing the borders in the different books with a view to seeing which is the least disagreeable to the eye instead of with a view to comparing beautiful designs with one another. The same criticism applies to the initial letters. They are not unlike their originals of the fifteenth century; they are not

bad as ornamental letters; they show, as the borders show, infinite cleverness in the varying of their forms and in the pattern of their backgrounds; but they are oppressive. They are too large, too numerous, too elaborately over-decorated. In fact, it might be said of the page as Morris conceived it, that it was much overdrawn, having too many fantastical and violently contrasting parts for a single page of a book.



KELMSCOTT PRESS MARK.

As a sincere and conscientious attempt to set one's self against the spirit of the age instead of working with it, the decorative work of William Morris must excite great interest and must command great respect. Nor can any student fail to sympathize with Morris's feeling that much was wrong with the art-spirit and especially with the decorative designing of the age in which he was born. It remains true, however, that nothing is gained by opposing the spirit of an epoch and that the only thing feasible is to work with it and try to influence it slightly. To work against it and to try to influence it all at once and violently to take another direction, is to throw away one's powers no matter how great they may be. William Morris was probably not by nature a great designer or even a designer of original force, but he had his mind full of the fine arts of the past and he had boundless energy, indefatigable resources of body and mind and almost infinite self-confidence. The natural result is the production of a certain amount of work which appears like success to the few and for the time, but which to the many seems foreign and uninteresting, and to the next succeeding brief epoch of time will appear a mere echo from the past.

Of the two books under consideration, the folio, as its title implies, is devoted to the graphic and decorative art of Morris's life while the octavo is a more general treatise, dealing with his literary work and

en in war, and that the Companions who had conquered it were looking for chapmen to cheapen their booty, and that he was the first, or nearly the first, to come who had will and money to buy, and the Companions, who were eager to depart, had sold him thieves' penny-worths: wherefore his share of the Upmeads treasure had gone far; and thence he had gone to another good town where he had the best of markets for his newly cheapened wares, and had bought more there, such as he deemed handy to sell, and so had gone from town to town, and had ever thriven, and had got much wealth: and so at last having heard tell of Whitwall as better for chaffer than all he had yet seen, he and other chapmen had armed them, & waged men-at-arms to defend them, and so tried the adventure of the wildwoods, and come safe through.

THEN at last came the question to Ralph concerning his adventures, and he enforced himself to speak, and told all as truly as he might, without telling of the Lady and her woeful ending. Thus they gave & took in talk, and Ralph did what he might to seem like other folk, that he might nurse his grief in his own heart as far asunder from other men as might be. So they rode on till it was even, and came to Whitwall before the shutting of the gates and rode into the street, and found it a fair and great town, well defensible, with high and new walls, and men-at-arms good store to garnish them. Ralph rode with his brother to the hostel of the chapmen, & there they were well lodged.

Chapter XIII. Richard talketh with Ralph concerning the Well at the World's End. Concerning Swevenham.

ON the morrow Blaise went to his chaffer and to visit the men of the Port at the Guildhall: he bade Ralph come with him, but he would not, but abode in the hall of the hostel and sat pondering sadly while men came and went; but he heard no word spoken of the Well at the World's End. In like wise passed the next day and the next, save that Richard was among those who came into the hall, and he talked long with Ralph at whiles; that is to say that he spake, & Ralph made semblance of listening.

NOW as is aforesaid Richard was old & wise, & he loved Ralph much

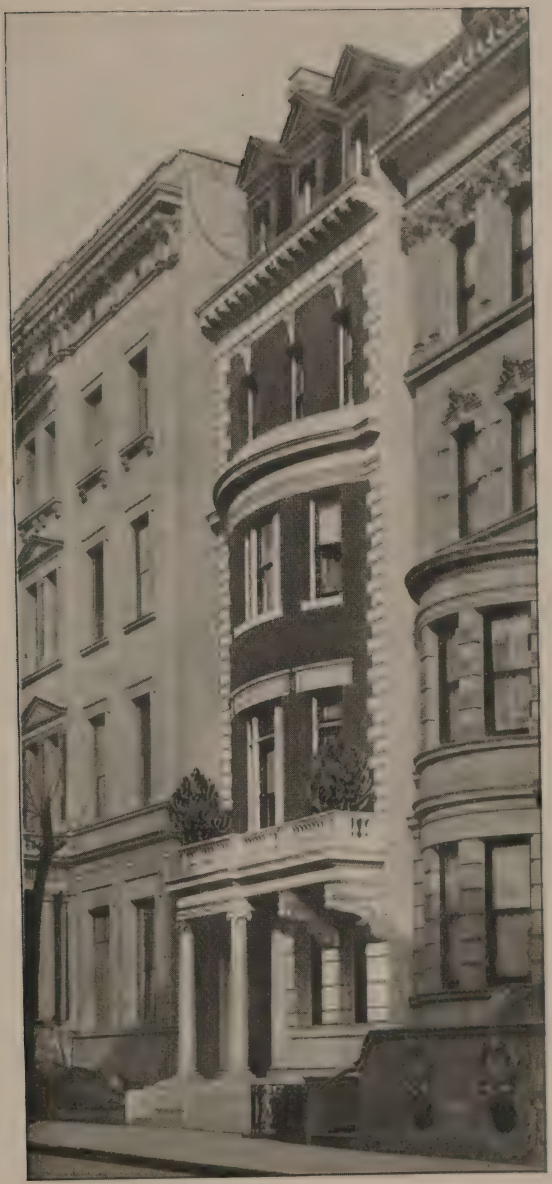
KELMSCOTT PRESS. PAGE FROM "THE WELL AT THE WORLD'S END."

his socialistic labors as well as his art. It appears that the octavo contains all the text of the folio, with very considerable additions. It also contains a few illustrations which are not in the folio in any form; that is to say, black and white plates of new subjects as well as black and white plates which are the equivalent of some of the colored plates of the folio. In short, the octavo is the more useful book for the general library and it is published at a price which makes it comparatively accessible, while the folio, originally issued at eight guineas and in a very limited edition—so that the price is already enhanced—is much richer in illustration of Morris's designs.

Russell Sturgis.

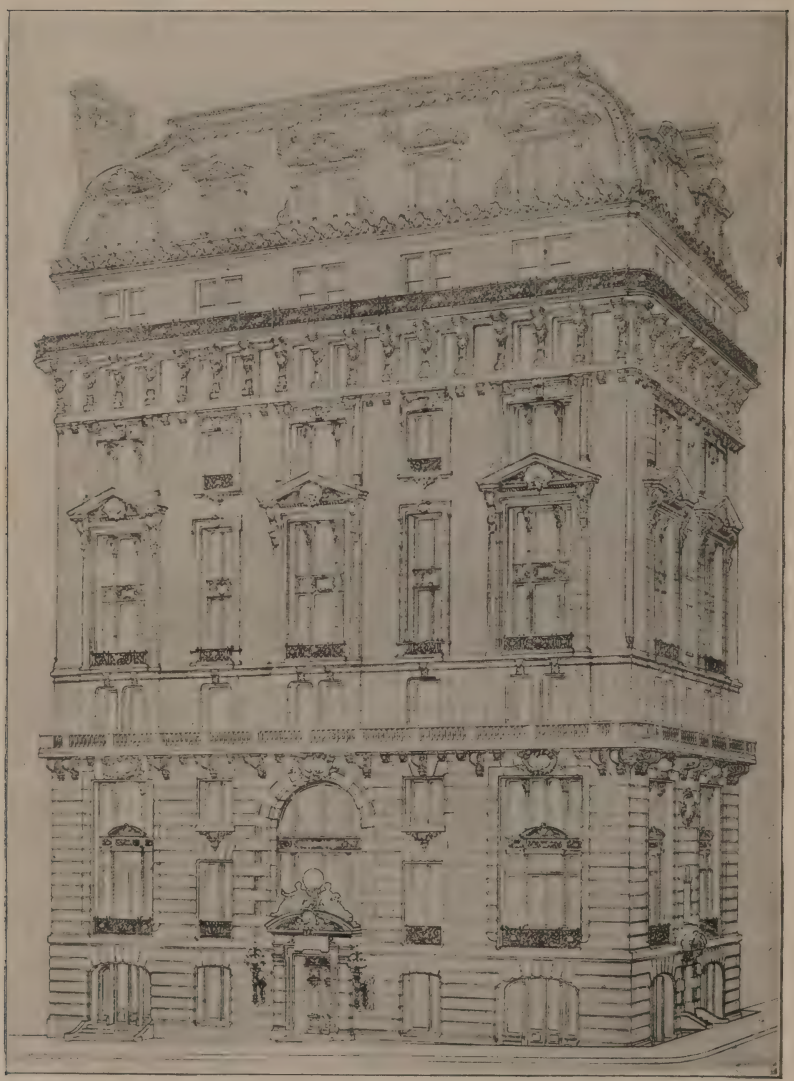


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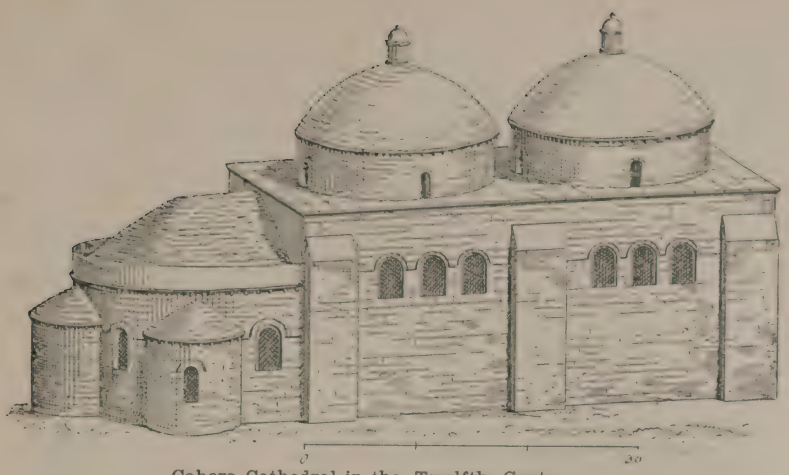
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Cahors Cathedral in the Twelfth Century.

FRENCH CATHEDRALS. Part XIV.

THE DOMED CATHEDRALS.

I.

THERE is no more interesting problem in French architecture than the development, in the west, of a group of churches with the dome as their predominating feature. Four cathedrals are essentially domical in their architecture: Cahors, Angoulême, and the two at Périguex S. Étienne and S. Front; the cathedral of Le Puy, which is also a domed church, stands apart from these. Notable types, each of them, of the twelfth century domed church in France, they by no means exhaust the list of great domed churches of this period. These cathedrals, with their sister churches built in the same way have long been the archaeological wonder of western Europe. Apparently they arose spontaneously from the soil, without hint of origin or connection with other structures. Yet their period was not given to sudden outbreaks in building experiments, and the history of all mediaeval architecture teaches no more important lesson than continuity and evolution. So it happens that the striking individuality of this group is due chiefly to the magnificence of their dimensions. For as a matter of fact the dome was an essential characteristic of all churches in Provence in the XI. and XII. centuries, and a series of domical churches runs across the map of France from the extreme southeast up to Angoulême, and, in a modified form, as far as Poitiers, Le Mans and Angers.

The dome is of common occurrence in early French churches, though the dome of Provence has little enough in common with those of Cahors, Périgueux and Angoulême. In Provence it is

small, rising from a square by means of small pendentives thrust into the corners; and it nowhere shows itself externally as a dome, though at Avignon and Cavaillon it appears as a lantern, and at Arles it is embedded in a vast tower. The western domes are of a very different class. Real pendentives, filling in the entire spandril between the arches, convert the square into a circle, without the intervention of the octagon of Provence. The domes are large and massive, covering a succession of bays, instead of a single bay, with an outward form that transforms the exterior of the church, giving it the strange exotic character that, in S. Front, at least, makes one wonder if one is in France at all.

And so these churches stand alone, notwithstanding the smaller domes to the east and south; for they were being built while the latter were still in construction. The progression is geographical rather than historical. Their individual interest is, therefore, very great, though strangely enough of no churches in France is history so silent; of their origin nothing is known, and even their more important dates are a matter of controversy; and no one can say with certainty that any one man was their builder.

Fortunately it is possible to fix their period at least approximately. The cathedral of S. Étienne at Périguex was dedicated in 1047; the cathedral of Cahors in 1119; the great abbey church of S. Front was burned in 1120, and the rebuilding of the present edifice begun soon after; the cathedral of Angoulême was dedicated in 1128. The last is the most complex in its architecture, and is manifestly the latest in the series; the progression is the natural one, from the simple little cathedral of S. Étienne at Périgueux, to the complex cathedral of S. Pierre at Angoulême. It will, however, be convenient to begin this survey with the cathedral of Cahors.

II.

The cathedral of Cahors is a comparatively small church of about 180 feet in total length. It has no aisles or external side chapels, and consists of a nave of two great bays, each with a dome, and a great seven-sided apse. Its chief periods are readily distinguished. The body of the church, the nave, the apse, and two of the apse chapels, are all that remain of the building dedicated in 1119, though their actual date may go back some years into the preceding century. In 1285 Bishop Raymond de Cornil began the building of the upper part of the choir, which was thus transformed into a Gothic structure. Lesser changes followed, including the complete rebuilding of the apse chapel to the right in 1484. The west front, with its two towers and massive facade, dates from the XIV. century, and the cloister was built under Bishop Antoine de Luzech (1494-1509).

The construction of the nave is very simple. Each bay is enclosed within four great broad pointed arches, the triangular spaces between which are completely filled with the pendentives. The transverse arches form the division between the bays, while under the longitudinal arches are small chapels beneath a gallery just below

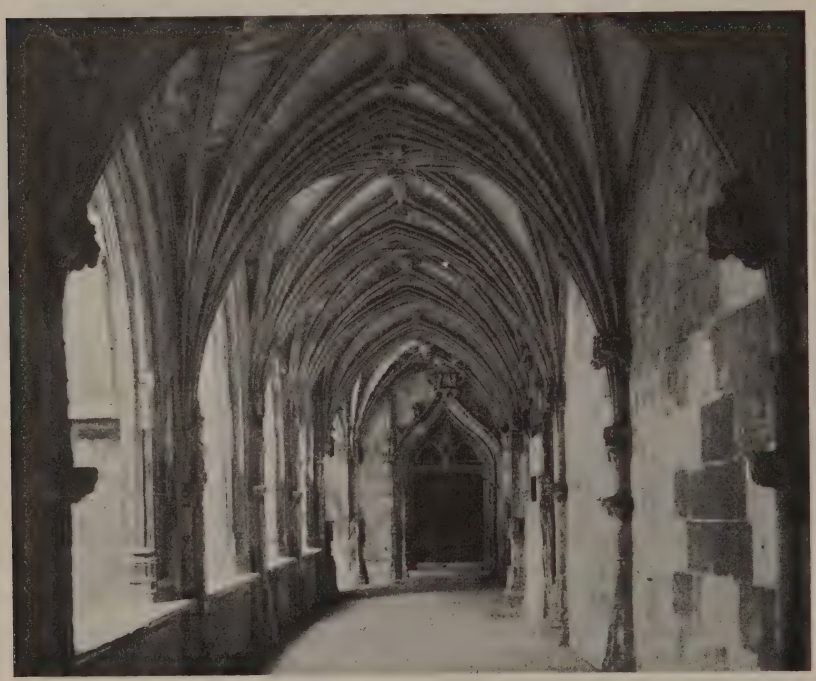


North Portal, Cahors Cathedral.

the windows that serve as a clearstory to light the interior. The general effect, as one descends the steps within the west door—for the ground outside has risen several feet above the level of the cathedral floor—is of that general tawdriness that seems inseparable to church interiors in France where towns, as Cahors, once important, have sunk to the level of the inactive provincial city. The frescoes that once adorned the domes, and adorned them notably, are

now only partly visible in the first bay, while the second one, and most of the walls, are covered with the whitewash that in evil days became the favorite style of church interior decoration.

The chapels on the sides, under the tribunes, project externally in a blocked-up strip of wall and scarce call for mention. On the north side, in the first bay, is a two-story gallery, with square piers and shallow Corinthian and Composite pilasters, each story and each bay separately vaulted; in the second bay a plain pier supports two round arches, with ribbed cross vaults within. On the south side the space in the first bay is unequally divided; a vaulted chapel opening out of



Cloisters, Cahors Cathedral.

a pointed arch, and then the pulpit; in the second, two pointed arches admit to small vaulted chapels. The fenestration over the tribunes is irregular and has been changed more than once. Each bay has, on each side, three round arched windows; but in the first bay, on the south side, two of these have been replaced by a large circular window, whose irregular situation is one of the curious pieces of construction in the cathedral.

The Gothic apse is very much loftier than any part of the nave, though unfortunately it was built at so late a time and by men so unfamiliar with Gothic construction that it possesses little delicacy of design. Its seven sides are alternately large and small, with two series of windows, the lower much larger than the upper. The small



West Front, Cahors Cathedral.

semicircular chapels opening from the second and fourth bays belong to the original construction; a larger late Gothic chapel opens from the sixth bay. A singular irregularity in the position of the large clearstory windows should be noted. Beginning on the north side the window is in the centre of the first and second bays; in the third it is placed to the east of the centre; but in the three remaining bays it is distinctly to the west side. The wall in which these windows are placed is recessed somewhat behind the lower wall, with a passage-way before it. All of the wall and vault surfaces are tinted or decorated.



Interior, Cahors Cathedral.

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North Side of Cahors Cathedral.

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The most notable external feature of the cathedral is the famous north portal, which dates from the last years of the XII. century, and which is one of the chief monuments of its time. It is a significant commentary on the later work at the cathedral of Cahors that this ancient portal should still remain its most interesting decorative part. Its lower portions have long been buried beneath the earth, and its two doorways are walled up; but its upper part is free, and while much worn by time and otherwise defaced, is an imposing and beautiful structure.

The porch is a rectangle applied to the flank of the western bay of the nave. Its centre is filled with a majestic pointed arch, cutting deliberately through the decoration of slender applied columns carrying small round arches, with which the walls are treated. The outer decorations of this arch have nearly all disappeared, as have the capitals of the wall columns and most of the wall ornaments; but it is still possible to distinguish the singular border of small figures of men and animals carried just within the outer moulding. The arch is very deep and not recessed as Gothic arches are. It is absolutely without ornament; but it is supported on either side by three small round arches carried on slender columns, whose bases are not now visible, and whose capitals, well preserved on the whole, are amazing compositions of twisted animals and birds, men and foliage. The wall within these arches is decorated with a series of large bosses or rosettes of great variety and beautiful design. Just above them are the remains of a spandril decoration too defaced for interpretation.

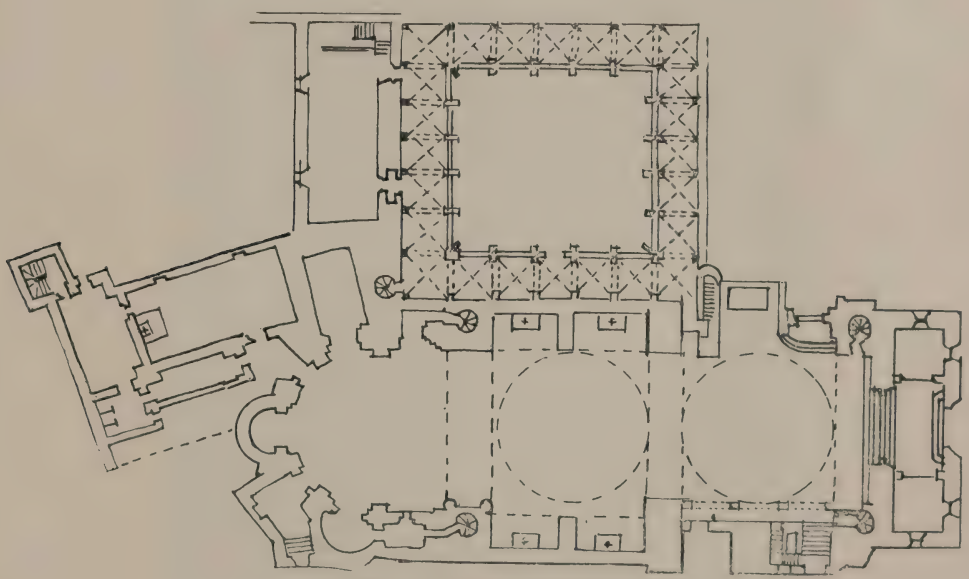
The archways of the doors and the column between them are greatly injured, but the tympanum, with its remarkable sculptures, is complete, though much worn and considerably injured. In the centre is a figure of Christ, standing in an aureole, one hand raised in benediction, while the other, also extended, holds the Book. On each side is a large adoring angel, while others float down from above. Below is a series of arches containing the Virgin in the centre and the Apostles in the others. The remaining parts, on each side of the central figure, are filled with several small groups, the Stoning of Stephen, Jesus and the Woman of Samaria, the life of St. Genou, etc. The whole is surrounded with a richly interlaced band.

Of the other portions of the exterior it is sufficient to refer briefly to the domes and the west facade. The former are built with plain circular drums carrying the low rounded domes without ornament. They have been restored in our time, their structure having long been hidden under a wooden roof. The west front is a singular structure, rising high above the church behind it, the wall being carried up in the centre and surmounted with a pyramidal roof, with wings slightly recessed near the top and treated as towers. There

is a single high pointed portal with a small rose window over it, and a small arcade continued on each side in a rather awkward manner. The Rev. J. L. Pettit, one of the earliest English writers on French architecture, in speaking of this front, says that it has "if I remember, rather a heterogeneous appearance." It would be difficult to describe it more aptly, nor more vividly to reproduce the impression it makes on the spectator.

But the Gothic work at Cahors is considerably redeemed from this charge of inefficiency by the cloister on the south side of the cathedral. This is a structure altogether charming; very rich in details; not greatly defaced, and offering, with its canopied piers, its elaborate mouldings and its splendid vaulting a striking contrast to the solemn grandeur of the older parts of the cathedral, as well as with the less perfectly designed and very much less ornate later portions. It is one of the few Gothic cloisters attached to any cathedral in France, and it happily warrants the most attentive study by reason of its own merits as a work of art.

Barr Ferree.



Plan of Cahors Cathedral.

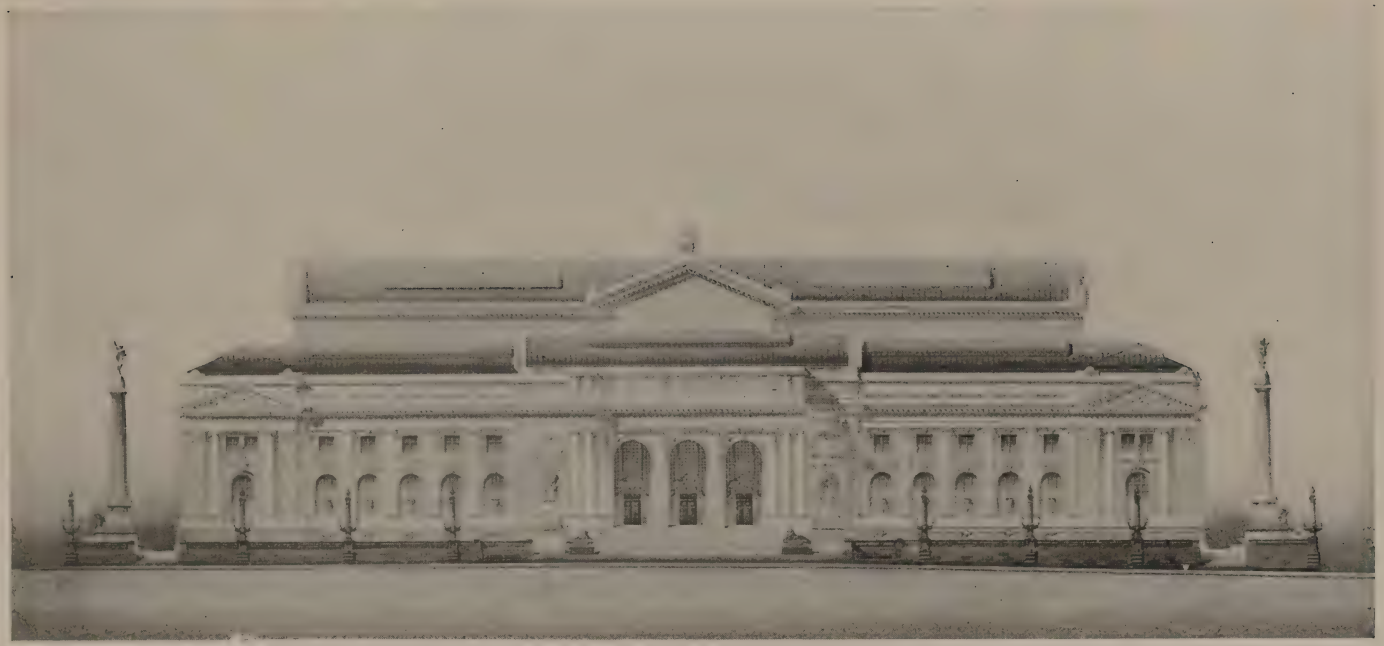


Grand Prix, 1893.

PROJET POUR LA SOCIETÉ DES SAVANTS.

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THE WORKS OF FRANCIS H. KIMBALL AND KIMBALL & THOMPSON.

FRANCIS H. KIMBALL entered the office of Louis P. Rogers, in Boston, in 1867, but for five years before had been in the employ of a relative who was a builder, and who, according to the rural practice, made such simple designs for buildings as were needed in his business. This gave his assistant valuable practice in plain drawing, which became available in an architect's office. Within a few months after the beginning of his apprenticeship Mr. Rogers formed a partnership with Gridley J. F. Bryant, and in their office Mr. Kimball took service. After 18 months of this service he was sent to Hartford by the firm to prepare the working drawings for the building of the Charter Oak Life Insurance Company, a granite building of some 275 feet of frontage. During the two years in which this building was under construction the firm was employed to build another business block for the Connecticut Mutual Life, which was to be fire-proof. For this also Mr. Kimball made all the drawings, residing in Hartford, subject only to occasional visits of supervision from the firm, and remaining until the completion of the building, having served an apprenticeship of three years and a-half. He was then engaged by James G. Batterson, of Hartford, and employed upon the competitive design for the capitol of Connecticut. At this time Trinity College had appointed Mr. Burges, of London, to design new buildings for it, and employed Mr. Kimball to report to Mr. Burges, so as to familiarize himself with the plans as they were making, and to be able to supervise the execution of them after they should be completed. The year in London was an apprenticeship in Mr. Burges's version of French Gothic, and an endeavor to give his American assistant such a knowledge of his way of working that he could meet the exigencies that might arise during the construction. This was fortunate, because not only was the actual construction confined to one of the four quadrangles included in the stately project, but even this was much modified in execution. While it was building Mr. Kimball was employed upon other works in Hartford, of which the most important was the Orphan Asylum, of which the design is not yet completely executed, a wing which is architecturally an integral part of the scheme, remaining to be added.

In 1879, Mr. Kimball came to New York under an engagement to remodel what was then known as the Madison Square Theatre, and is now known as Hoyt's. In the same year he formed with Thomas Wisedell, an English architect of Gothic predilections and

training, a partnership, which lasted until Mr. Wisedell's death in 1884. The Madison Square Theatre, Harrigan & Hart's old theatre in Broadway, long since destroyed by fire, the Casino at Broadway and 39th street, the Yonkers Opera House, the Goodwin Building, in Hartford, and a new building for Trinity College were the most important works of the firm.

From 1884 to 1892 Mr. Kimball practised alone, excepting one year, 1886, in which Mr. Henry S. Ihnen was his partner. The works of this period included the Catholic Apostolic Church, in West 57th street, a large church at Nashville, the Emanuel Baptist Church in Brooklyn, the Montauk Club in Brooklyn, the Corbin Building at Broadway and John street, the Fifth Avenue Theatre, Harrigan's Theatre, now the Garrick, the façade of the main station of the Reading road in Philadelphia, a chapel at Spuyten Duyvil, a theatre in New London, another in Middletown, and a number of country houses.

In 1892, Mr. Kimball entered into partnership with Mr. George Kramer Thompson for the building of the Manhattan Life, which the new firm gained in competition. Mr. Thompson, born at Dubuque, in 1859, received his general education at Fairbault, Minn., and Lancaster, Pa., directing his studies with special reference to the profession of architecture, which he had already chosen for himself, and in 1879 entered the office of Mr. Frederick C. Withers as a student. After three years with Mr. Withers he engaged as a draughtsman with Kimball & Wisedell for a year, and in 1883 entered into partnership with Mr. C. P. H. Gilbert for a year and a-half, and after that practised independently, his work consisting chiefly of private houses, until the formation of the firm as already explained. The principal works of the firm are the Manhattan Life Building, the Standard Building for the Standard Oil Company, the Empire Building, not yet completed, extensive alterations in the store of Messrs. B. Altman & Co., an extensive and costly mansion at Madison avenue and 72d street, a store in Philadelphia and a pumping station for the Indianapolis Water Works.

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Victorian Gothic begins to seem very remote, the more to some of us is the pity, and it may at least be regarded in an undistorted historical perspective. By Victorian Gothic I do not mean especially that Italianized mode of mediaeval architecture, which was distinguished by the free introduction, in exteriors and interiors alike, of as many colors as could be found in available building material, and as could be harmonized in a design, and very often more. This was what is specifically known as Victorian Gothic, and it was introduced largely through the eloquent enthusiasm of Mr. Ruskin, who really cared more about the mediaeval building of North Italy than

about the French Gothic of which it was a picturesque degeneration. On the technical side such works as Streets' "Brick and Marble in Italy," gave impetus to the movement, which, however, was but an episode of the Gothic Revival. What I mean is the Gothic revival which indeed had been begun, on archaeological and ecclesiological rather than on artistic considerations, before Queen Victoria's reign, but which during that reign attained to a much higher degree of historical accuracy and scholarly competency than before, and also to a much more just comprehension of what the root of Gothic architecture was, and that this root was adequate not merely to have produced the forms which the early revivalists set themselves to reproducing, but also to grow new forms in a new material and moral environment. If this truth had been apprehended clearly enough and by practitioners numerous enough, there would by now be no longer a question of "style," but architects would be doing architecture.

Failure as we have to own that it was, the Gothic revival showed enough of the promise and potency of life to attract a great majority of the ambitious young architects of England and America during the sixth and seventh decades of the century, say from the London World's Fair of 1851 to the Philadelphia World's Fair of 1876. What there was of life and progress in English and American—nay, in European architecture—during that third quarter of the century came from it.

It will be agreed that a young American practitioner could not have served a more valuable apprenticeship to his craft at that time than that which Mr. Kimball was privileged to go through in the office of William Burges. Nobody will dispute Mr. Burges's claim to a place among the leaders of the Gothic revival in England. In the archaeological part of his equipment he had his equals, and possibly his superiors, but many of the Gothic archaeologists were actually burdened with their knowledge when the question was of designing, and the result of their labors was apt to be more in the nature of a reproduction than of a revival. Mr. Burges differed from most of his coworkers in starting neither from the English Gothic, which patriotism induced so many of them to adopt, nor from the Italian into which others were led by Mr. Ruskin's eloquence, but from the parent French Gothic. "Only primitive sources furnish the energy for a long career." In this he really attained freedom and individuality. Cardiff Castle and the Cork Cathedral are likely to be admired as long as they stand, as among the most fruitful results of the Gothic revival. But to many students, including the present writer, the high-water mark not only of Mr. Burges's own work but of the Gothic revival, was attained in his unexecuted design for the Law Courts, which, although it remained on paper, furnished the



Hartford, Conn. Trinity College.—1875. W. Burges, Architect.
F. H. Kimball, Supervising Architect.

inspiration for some admired buildings on each side of the Atlantic. A sojourn in his office, followed by the supervision of an important work of his, was nearly as good a course of professional preparation as a young American architect could have obtained at that time. Certainly it was a wholesome corrective after a course of the entirely commonplace American commercial Renaissance of that time, in detailing and supervising which Mr. Kimball had already familiarized himself with building operations. Its influence is to be detected not only in the work which Mr. Kimball did in Gothic, but in that which he has done in classic. Certainly his own "commercial Renaissance" has more affinity with Mr. Burges's French Gothic than with the commercial Renaissance of his earliest apprenticeship. And, indeed, there is this to be said for the real study of any style, as a preparation for the practice of architecture, that it does confer a perception of proportion and relation and scale which is as valuable in one style as in another. It is indispensable when one comes to deal, as it is to be hoped that the architects of the future will be bold enough to deal, with constructions which are as yet "ferae naturae," and for which they have to find artistic and expressive forms, constructions which have not yet been reduced by the labor of generations to that assorted set of forms which we call a style. Certainly in Mr. Kimball's work the influence of Mr. Burges may be traced in works which in purpose and style have no relation to anything that Mr. Burges himself ever had occasion to undertake.

A detailed consideration even of the important works of the architect is quite out of the question with the space at my command. It



HARTFORD ORPHAN ASYLUM. F. H. Kimball, Architect.

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seems most convenient to arrange them in groups comprising first those which betray most directly the results of his studies in Gothic, including those which he did in association with Mr. Wisedell, then the miscellaneous work of an architect in general practice, and finally the sky-scrapers, which are the works of Kimball & Thompson, and the most costly and conspicuous with which he has been connected.

Mr. Kimball's first independent work of any importance, the Hartford Orphan Asylum, was designed while he was still employed at Trinity College, and might be expected to be an extreme example of Gothic. Possibly it was for want of money that the style is not more distinctly designated. The buttresses of the wing, and the arcuation of a few of the principal openings are to a casual inspection almost the only badges of the style. Otherwise the work is simply an example of artistic building; that is to say, it aims at such a disposition in mass and such a treatment in detail as to express the arrangement, the material and the construction. That was the gist of the Gothic revival, only unfortunately its practitioners were not able to convince the public of that fact. They introduced into their work in all kinds features of historical Gothic which not only enabled the wayfaring man to designate the buildings as Gothic, but forced him to associate them with ecclesiastical architecture. He declined to accept them as either modern or secular, and small blame to him. The fault was not his, but that of the revivalists, with the repertory of irrelevant quotations with which they insisted upon garnishing their ordinary conversation. If all the secular work of the Gothic revival had been as straightforward and expressive, and as successfully designed as this asylum, the wayfaring man would not have perceived it to be Gothic, while it would have been more truly Gothic all the same. The same praise belongs to a house in Waterbury, in which a superstructure, hung with red tiles, surmounts a brick basement, and in which the style is designated only by the two lancets that might have been lintelled or round-arched without detriment to the effect. This work is straightforward in its treatment of material, and really happy, considering the practical exigencies to be met, in the proportion and the relation. Its success in this respect even makes us overlook the painful weakening of the angle pier by its openings. But for these lancets which classify it as Gothic one would have to classify it merely as artistic building, as a work which is of no style and which yet has style, and that is aone of the rarest and one of the most desirable attainments of the modern architect.

Another country house, or at least detached house, a dwelling in Hartford, has the same attraction of appearing to result from a consideration of the end to be attained and the means to be employed,



Residence of Dr. C. S. Rodman.—1879.
Waterbury, Conn. F. H. Kimball, Architect.

rather than a recollection of what has been done elsewhere. This is a roof-structure of timber, set upon a two-story rectangular of rough masonry. The rectangle is so modified by truncation and projection and recession as to get rid of the look of being a box,



Residence of Mr. Franklin Chamberlain.—1881.
Hartford, Conn. Kimball & Wisedell, Architects.

and as to account for the difference in the roofing, which enables the designer to crown it very effectively. Here there is no designation of a style. There is nothing which at least might not have proceeded from consideration of the requirements of this particular edifice. One can imagine an inspired mechanic doing it without knowing that there were such things as styles, or such a thing as historical architecture. It is true that he might have been better inspired if he had been less afraid of repetition and had not insisted upon so widely varying the forms of the two gables upon each front, which seem to perform exactly similar functions. A capricious departure from symmetry is no more to be commended, when there is not a real difference to be expressed, than a rigid adherence to it in spite of such a difference. It is also true that there is no such mechanic now extant in the world, nor has there been for some generations, common as he was five centuries ago. But the signs of the lost architecture of craftsmanship are none the less welcome, even where we know that they must have been exhibited not by a craftsman at all, but by a book-learned architect over a drawing board.

Another work of a very different destination which has this same character is the brick warehouse in New York, of which the architecture is the expression of the simplest possible construction. A ground floor with entrances at the sidewalk level, into which wagons can be driven, five stories of lofts for storage, undivided or equally subdivided, an office in the corner of the ground floor, with enough glazed holes in the wall to light it, a stairway at the back, giving access to the upper floors; nothing can be simpler, and nothing can be more frequent, nothing better within the capacity of the common craftsman. To him, indeed, the design of structures of this class is commonly intrusted, with the most depressing results. The real reason why they are so depressing is, of course,, that he does not know how to dispose the features required by the bare necessities of the case so as to combine them into a countenance, and hence the aspect of his work is dull and inexpressive. What makes it not negatively unattractive, but positively repulsive is that he does not know how to let his bald building alone, but adds to it something that he dimly imagines to be architecture. What makes such a work as this now under consideration so welcome is that the designer is aware of the desirableness of disposing his openings, and know how to dispose them, so as to get the effect of massiveness where it is most needed, in place of the equal alternation of pier and opening. There are few street fronts of the same dimensions so impressive as the narrow front of this warehouse, by dint of the sheer power of the flanking piers. But also he has confined himself absolutely to the structural necessities and made his effect by his abstinence. The thickening

of the lower walls in pilaster-buttresses is plainly reasonable, and it has the effect of seeming powerfully to load and hold firmly in their places the piers of the arcade, while the rounding of these piers, which adds so much to their effect is an expedient to diminish the danger of chipping. The terminal piers are kept very broad at one end by diminishing the office lights, and at the other the staircase



Warehouse.—1886.
Hudson and Beach Streets, New York City. Kimball & Ihnen, Architects.

lights, to their lowest terms. The anchor strips, which so happily punctuate the expanse, are structural expedients employed in the most straightforward way. Perhaps the effect of the building would be as good without the one piece of conscious architecture the designer has introduced in the gabling of the upper wall over each bay of the substructure. This is one of the many devices that have been resorted to for mitigating the baldness of a flat roof, in the absence

of a heavy protective cornice, and is discreetly handled. Over the end, where it suggests a pitched roof, it is undeniably effective, but on the longer front it looks a little capricious, and is thus inconsistent with the hard utilitarianism to which the designer has elsewhere restricted himself. There is something of caprice, too, in varying the fenestration of the two upper stories from what is below. The uppermost, as a crowning story, might very properly have been distinguished in treatment, and even marked off by a slight string course such as is so effectively introduced at the angle, and the four stories below treated alike. But whatever abatements are to be made, the beholder has to say that here is a building of no style



1885. Manhattan Beach Amphitheatre F. H. Kimball, Architect.

which yet has style, and he may very well reflect that if our buildings of bare utility were all as good as this, and were confined as closely to bare utility, our architecture of ornament would soon grow itself, and be as plainly indigenous as it is now plainly exotic.

Much the same praise may be given to a much larger and a properly much more pretentious work, the band stand at Manhattan Beach. This is in fact a permanent tent, reared upon a base hung with parti-colored wood shingles, open to the air above that, and covered with a roof which is merely a velarium. If one looks closely he may detect Gothicism in the decorative detail in wood with which as a festal place it is properly provided. But upon the whole it is a piece of free ar-

chitecture in which the picturesqueness of the result is not only appropriate and unforced, but proceeds from the special conditions of the problem. It is not often that one finds such a series of works by one architect, which, being of no style, yet have style, and possess that idiomatic and vernacular air which pertains to the architecture of craftsmanship. While they are not Gothic, except in principle, I think it may fairly be claimed that those of the Gothic revivalists who went beyond a knowledge of Gothic forms to an apprehension of Gothic principles gained thereby a facility for doing them which is not supplied so well by any other training. It is not very risky to say that it was to his apprenticeship to Mr. Burges that Mr. Kimball owed much of the power of producing works superficially so unlike any of the work of his master as the dwelling in Hartford, the warehouse in New York, and the band stand at Coney Island. It is quite certain that such works, proceeding not from the application of fashionable architecture but from their own respective requirements, will not come to look antiquated or ridiculous when the fashion had passed away.

But, of course, it is plain enough that the mode of design which these buildings illustrate is applicable only to comparatively slight and simple buildings. Where it is a question of a large and ornate and urban edifice, the designer must invoke some system of ornament. As a system of ornament is neither invented by one designer, nor is vernacular in this or any other modern community, this means that he must, for such a purpose, work in a style. In church building it is pretty well agreed still that, obsolete as the mediaeval styles have become for secular work, it is in Gothic or its parent, Romanesque, that he must work. An attempt in any of the classicised styles handicaps itself at the beginning by having to most beholders the air of a joke, which is to say, of a profanation. In Mr. Kimball's churches the influence of Mr. Burges is naturally to be detected most strongly, but decidedly the pupil brings something of his own. Perhaps Christ Church in Nashville does not bear out this remark. There is more than a trace of Mr. Burges's manner, especially in the treatment of the gable window and the picturesque hooded bell-tower, although the lancets in the tympanum of the entrance recall English rather than French examples and carry even a suggestion of Perpendicular. But upon the whole it would not be unfair to describe this work as Gothic working *in vacuo*, the kind of architecture which we have a right to expect of a trained designer who has no artistic individuality in particular. But nobody would make such a description of the Emmanuel Baptist Church in Brooklyn or of the Catholic Apostolic Church in New York. In the former it is necessary to point out that the architect was ham-

pered by the previous erection at other hands of the chapel in the rear, of which the detail is mercifully screened in the photograph by foliage. The body of the church is evidently a very rich, scholarly and well considered design, in which the triple porch, with its stilted arches, and the treatment of the towers especially recall Mr. Burges's work, and in which the mullioned windows both in the aisle wall and in the centre of the front are very admirably designed and detailed, and of which the deep reveals are so modelled as to get the utmost advantage of their depth. All this is by no means Gothic *in vacuo*, and much further from that is the interior. In this the



Entrance, Emanuel Baptist Church.—1885.
Brooklyn, N. Y. F. H. Kimball, Architect.

"*nuance*" of the denomination, so to speak, offered one of those opportunities for distinctiveness of expression which architectural copyists shirk, and which architectural artists welcome. The "font" is the central feature of a Baptist church, and the scene of its most distinctive rite, but it is completely ignored or dissembled by the designers of Baptist churches, whose pleasing and ingenious practice it is to conceal it under the platform, and open trap-doors when it is to be used. Occasionally a Baptist congregation falls into the hands of an artist and some appropriate and expressive modes of treatment have been proposed or executed. That carried out by Mr. Kimball is very successful. The font with its pool is the central and most con-

spicuous object in the church, walled in by an enclosure of sumptuous marble and flanked by open arcades which enable the converts to make their exits and their entrances with decorum. The enrichment of its details is the more effective from its being strongly and simply framed between plain walls of stone work, opened above



Emanuel Baptist Church.

Brooklyn, N. Y. F. H. Kimball, Architect.

into the arches that enclose the organ. In fact this end of the church, it will be agreed, is an extremely pretty and successful competition. At the opposite end, the effect is somewhat weakened by the impinging of the two arches upon a single pier which they tend to thrust outward, and which is not visibly adequate to withstand their thrust. But the arrangement enforced by the omission of the clere-

story—the single girder which carries the main roof and the manner in which the lunetted ceiling of the aisles is terminated against it—all this is skillful and well studied, and the detail everywhere is refined.



Emanuel Baptist Church.
Brooklyn, N. Y. F. H. Kimball, Architect.

Another noteworthy work of Mr. Kimball's in Gothic is the Catholic Apostolic Church in West 57th street. I do not know whether the ritual of this denomination, of which I believe this is the only church building on this side of the Atlantic, has any peculiarities which might become the basis of a distinctive architectural treatment, such as the baptismal rite offered in the last example. At any rate the interior is merely a well-behaved, well-proportioned and well-detailed piece of Gothic, except for the deep apsidal chancel,

with unusually small openings, and unusually large wall spaces, and a domed roof, which gives it a Byzantine air, though quite congruous with the rest. The church has, indeed, its peculiarity, but this proceeds rather from its situation than from its destination. It is a church on an "inside lot," or rather on two inside lots, and the problem attacked in the plan is that of securing for it a sufficient lighting,



Emanuel Baptist Church.
Brooklyn, N. Y. F. H. Kimball, Architect.

which shall not be interfered with, whatever may come to be built alongside. From the aisle and transept walls it can receive no light, since these may abut upon solid buildings. The clerestory becomes a necessity, and the interior must be abundantly lighted from its openings. This primary requisite determines the design, and the close adherence to it and the artistic expression of it make the design very characteristic. A symmetrical treatment, with a low porch on either side masking the aisle, detaches the central nave into a tower-like structure, developed into an actual tower, of the square of the front, with a saddle-back roof, and a pinnacle at each corner. Behind this appear the two gabled windows of the clerestory of the nave, and on each side the window of its respective transept. The arrangement is expressed in a clear and edifying way, of which the effect is immensely heightened by the excellence of the detail in design, and its perfect adaptation in scale. There is no more scholarly Gothic work in New York. The charm of it is heightened



1885.
Catholic Apostolic Church.
West 57th St., New York City. F. H. Kimball, Architect.

by the fact that, although the ornament is in terra cotta, and is or might be for the most part a substitute for stone-carving, there is yet in some of it, as in the main offset of the front and the gableted offsets of the buttresses, a recognition in design of the material which adds the raciness of idiom to scholarly diction.

But in this respect, in the recognition of the capabilities of terra cotta, an earlier work, the Casino, surpasses not only this church, but every other building in New York. This was the chief work of Messrs. Kimball & Wisedell, and the conjunction was so perfect that probably neither partner could have picked out his own share in the completed result. One never tires of praising this admirable work, though in looking at it in its present degraded and vulgarized estate



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1882.

THE CASINO THEATRE.

Broadway and 39th Street. Kimball & Wisedell, Architects.

one may feel not only weariness but resentment. The former proprietor, however, appreciated and respected it, and recurred to the advice of its authors in maintaining it, so that even the injury of an outside fire-escape was mitigated to the minimum. To put a thea-



Casino Theatre.
Broadway and 39th Street, New York City. Kimball & Wisedell, Architects.

tre at the acute angle of Broadway and a cross street, with the least waste of room, was one of the problems, the difficulty of which the incompetent designer finds impossible, while it adds zest to the labors of the competent designer. It was a singularly happy solution which the designer of the Casino attained. The symmetrical and elaborate front on Broadway, which contains the dependencies of the theatre, is couterparted by the front, in which the swinging curve of the auditorium is boldly shown and emphasized, and the

difficulty of harmonizing the two is triumphantly overcome by the massive tower which occupies the angle and mediates between them. The mixture of styles which the building shows is done with such skill that there is only an academic violation of the architectural unities. And the mixture has real reason. So expressive a mode of treatment could scarcely have been carried out except in Gothic. But the ornamentation had to be in baked clay, and there is no other style which contains anything like such a repertory of surface ornament at the Saracenic in its various modes. More than one of them is introduced here, for there are features which recall the Mahometan architecture of Egypt in the wealth of detail that is directly or ultimately derived from the Mahometan architecture of Spain. The building exhibited a prodigality of detail in terra cotta which had no precedent here at the time of its erection, and has not had many equals since, and none of them has equalled it in the idiomatic treatment of material, which in these latter years of open or disguised copying it has been forborne even to attempt. The exterior of the Casino is almost as unmistakably of baked clay in the photograph as in the fact. The adjustment of the ornament in place and scale is not less successful, nor does it imply less study than its design. And the interior is as carefully and successfully detailed as the exterior, and it shows the same fusion of styles, insomuch that the combination of Moorish arabesques with English fan-tracery does not affect the beholder with any sense of incongruity. No building in New York bears more evidence of intent and affectionate study, and the "professional services" implied in it are not at all commensurable with those involved in the mechanical reproduction which the reproducers try to persuade us is architectural art. Such a building as the Casino of itself entitles the authors to public gratitude.

The Montauk Club in Brooklyn is an essay in that Venetian Gothic of which we have, considering our tendency to try all things architectural, surprisingly few examples. It is a style especially appropriate to a club house, first by reason of the undeniably festal aspect which it wears more strikingly, perhaps, than any other mode of mediaeval architecture, and also, and more specifically, because the Venetian palazzo resembled a modern club house in the simplicity of its division into few and large apartments, a division naturally expressed by its exterior architecture. The present essay suffers in comparison with its prototypes, from the fact that in the Venetian palaces—excepting the Doge's, where the solid upper story is made the object of a treatment quite unique—the upper story is the lightest and richest. The traceried arcade of the loggia takes its proper place at the top, as the flower of which the substructure is the stalk. The practical requirements, in the case

of the Montauk Club, prevented this disposition. The arcades have ample abutment and enclosure in the solid flanking masses of wall, and they are successfully studied in their relation to each other. If they formed the crown of a building, over a wall much more solid, the arrangement would leave little to be desired. But artistically they lose much of their point when the solider part of the build-



Montauk Club.—1890.

Brooklyn, N. Y. F. H. Kimball, Architect.

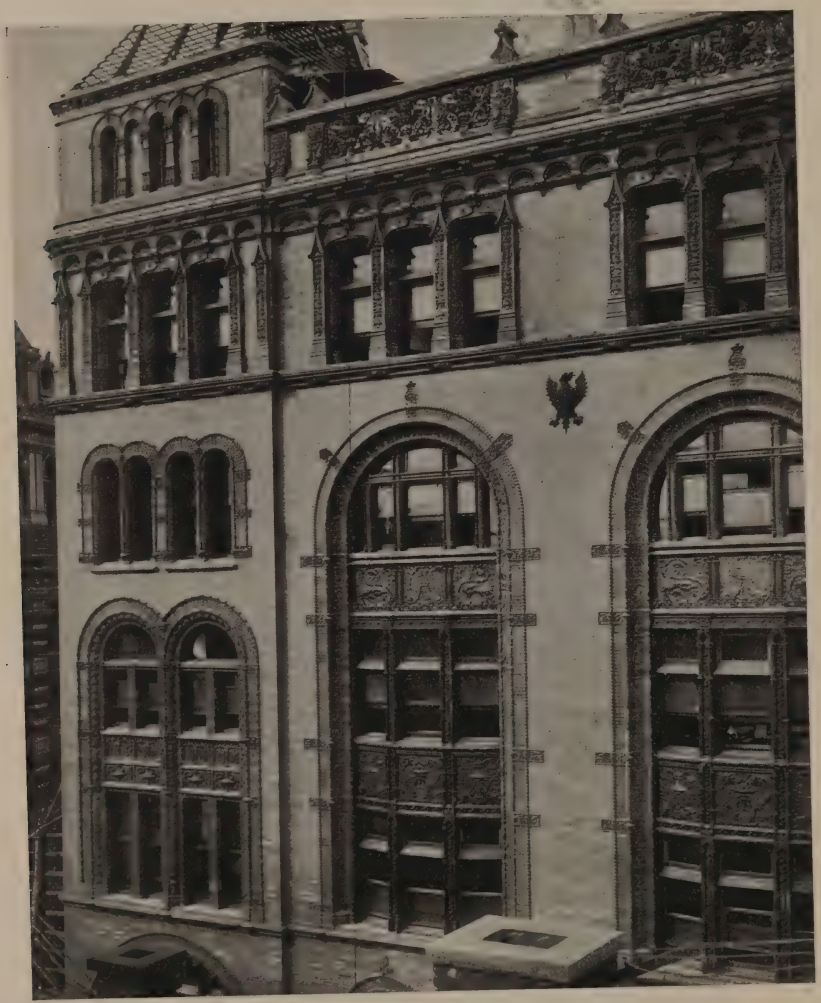
ing is superposed upon them. There are no precedents in Venetian architecture for the arrangement actually adopted, and there is, accordingly, a pretty distinct incongruity between the three principal stories and the two additional stories above the balcony, in addition to the incongruity already noted in the arrangement of these three stories themselves. In truth the plan does not naturally work out into the architecture adopted, and it seems a likely conclusion that the designer chose



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CORBIN BUILDING—1888-1889.
Broadway, Northeast Corner John Street. F. H. Kimball, Architect.

his style first and fitted his building to it afterwards, in a rather Procrustean fashion, of which the structure bears the marks. In a word, the building lacks unity. One cannot blame an architect for being enamored of the rich and brilliant effect of the superposed arcades, which are not only disposed with skill, but



Upper Stories of Corbin Building.
Broadway, Northeast Corner John Street. F. H. Kimball, Architect.

detailed with successful care. The two lower stories by themselves constitute a very satisfactory piece of work, and the detail throughout is refined and well adjusted in scale. But none the less the main structure and the two upper stories do not belong to each other, and the main structure does not altogether belong to itself. One cannot help wishing that the designer, in working out his plan,

had forgotten his Venetian Gothic, or had adjourned it to a more convenient occasion. And yet it seems ungrateful to quarrel with so picturesque and effective a feature as these superposed loggias make in our street architecture. If it had been practicable to erect them over a plain basement, or even to roof them over, with a light and open attic, as they stand, the Montauk Club would have been as successful as it undeniably is interesting

Equally interesting and more successful is an example of commercial architecture, the Corbin Building. This belongs to the intermediate stage of our commercial architecture, before the steel frame had come to complete the work begun by the elevator, and to remove the limit upon altitude imposed by the necessity of actual walls. It seems odd that only a decade ago architects were struggling to "keep down" into some proper relation to their other dimensions an altitude the maximum of which did not exceed ten stories. The attempt has now been given over altogether, but it is always manifest in such of the intermediate buildings as were done by artistic designers, and it is very obvious in the Corbin Building. An architect weary, except for pecuniary reasons, of skyscrapers, who should have a chance to do a building on Broadway, 160 feet long by "only" eight stories high, would think himself artistically in luck, and would not give himself much concern about dissembling the excessive height. Perhaps it would have been better it Mr. Kimball had given himself less, for his solicitude induced him to divide his building into two virtually equal parts of four stories each. This equal division is always a misfortune, and the misfortune is rather emphasized here by the repetition of parts, each half having an enriched upper story, or frieze, consisting in the lower of an arch filling each terminal bay, while each intermediate bay is occupied by an arcade of two or three openings, and in the upper of a series of groups of segmental arches. The equality is somewhat palliated, however, by the fact that the upper story of the lower half, the fourth of the building, is in the material of the upper half, tawny brick and dark brown terra cotta, while the three lower stories are in dark brownstone. But if the upper half had been extended a story downward, and the intermediate story made the third, the appearance in the front of being "divided against itself" would disappear, and a harmonious relationship of parts would be established. The actual arrangement no doubt tends to keep the building down, though scarcely more than that suggested; but it could only be justified if it were accounted for by an evident change of function in the parts which here, of course, cannot be made evident, since it does not exist. The effect is of two complete buildings one superposed upon the other, rather than of one building, and this is incompatible with the entire success of the design. The lower four stories, or the

upper five, taken by themselves, have more the air of a complete and single building, than the aggregation of eight.

In spite of this drawback, the work is of a very high interest. If the vertical disposition of parts leaves something to be desired, the lateral division is entirely satisfactory. The width of the narrow front taken from each end of the longer, makes a pavilion which supplies a frame and apparent abutment for the openings of the interval, and the effect of abutment is enhanced by the slight recession of the intermediate wall. It is still further promoted by the difference in treatment of the pavilions, the large arches of the lower division flanking the groups of openings of a single story, while the arches that enclose the arcade of three stories are lower in height and multiplied in number. At the Broadway end, the pavilion works out naturally and effectively into a tower, and the tall arcade is a very impressive feature.

The detail is throughout of the admirable quality and accurate scale to which the other works of Mr. Kimball have accustomed us. The difference of material gives occasion for an excellent object lesson in the appropriate differences of treatment. The stonework is austerely plain, except in the entrance at the rear to the upper stories. Even this is rich only by comparison, and the detail is plainly masonic. On the other hand, the greater plasticity of terra cotta is fully recognized and taken advantage of in the detail of the upper stories, where such a plainness as that of the basement would indicate that the designer did not know the capabilities of the material. We can scarcely see elsewhere in New York, except in Mr. Kimball's own work, so idiomatic and characteristic a treatment of terra cotta on so elaborate a scale. The upper story in particular, with its groups of segmental arches, the panelled pilasters sharpened to take the skewbacks, the shell frieze and the rich incrusted panels of the parapet, constitutes a model of design in baked clay.

I have not mentioned, and even now I can barely mention the theatres which constitute so important a part of Mr. Kimball's work. They are so important a part of it, indeed, that if an architect whose practice has been so varied could be described as a specialist, theatrical architecture would be his specialty. His experience has been recognized by the application to him, in view of it, to prepare those sections of the New York Building Law which deal with the special precautions enforced upon the owners of theatres. As has been said, it was the remodelling of the Madison Square theatre which brought Mr. Kimball to New York, and which occasioned his partnership with Mr. Wisedell. The reconstruction of that theatre produced one of the most attractive and artistic interiors of its kind, in the "bijou" class, that New York then contained, and it is still



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1893.

MANHATTAN LIFE BUILDING—EXTERIOR.

Lower Broadway. Kimball & Thompson, Architects.

wrought with respect to its own qualities, of which the Casino gave the first and most brilliant example, and which Mr. Kimball continues to have much more to himself than is creditable to the general run of designers who dabble in terra cotta.

The "sky-scrapers" to which these latter years of Mr. Kimball's work have been devoted, and to which the work of Kimball & Thompson has been pretty exclusively confined, come next to be considered. We move so very fast, in the way of commercial building, that we are apt to forget that the Manhattan Life Building was a pioneer. That is to say, although it has not yet been finished four years, it was one of the first examples of the possibilities of altitude afforded by the steel-frame construction, which removes the walls altogether and with the walls the necessity of considering the thickening of the walls as so much of a deduction from the available area of the building. This necessity, as has already been pointed out, fixed a limit upon the altitude practicable to an elevator building when the elevator was the only heightening factor to be considered, and that altitude was fixed, approximately, first at eight stories, and afterwards, as builders grew bolder, at ten, which remained the maximum of buildings constructed with walls of masonry adequate to carry themselves. But the Manhattan Life was very nearly, if not quite the first of the office buildings to be erected after this restriction was removed, and when the practicable limit of height, in the absence of any legal restriction became an open question. It is an open question yet, and nobody would be very greatly surprised, in view of what has been done already, if the announcement of a thirty-five or even of a fifty-story office building were now to be made. "Es in dafür gesorgt," says Goethe; provision is made that the trees shall not grow into the sky. But really it is difficult to discern the provision which has been made that sky-scrapers shall not grow into the sky, or the limit upon their height that is imposed by the law of supply and demand, which is the only law that has thus far been invoked in the premises. The project for the Manhattan, with its modest sixteen or seventeen stories, was much more startling when it was broached, than a project for twice that number of stories would be now. It was to be "the tallest building east of Chicago." What I wish to point out is that this sudden enlargement of the vertical dimension let in an entirely new system of design. The seven-story buildings with which elevator building began, or even the ten-story buildings in which the elevator building culminated, so long as they were built with real walls, did not bring about an architectural revolution. It was still possible to follow the analogy of the three-story, or of the five-story building, by making the architectural stories multiples of the actual stories. But when the actual stories grew into their 'teens' this



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MANHATTAN BUILDING.

Broadway Entrance. Kimball & Thompson, Architects.



MANHATTAN BUILDING.

New St., Entrance, Kimball & Thompson, Architects.

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DIRECTORS' ROOM, MANHATTAN BUILDING.
Kimball & Thompson, Architects.

BOSTON PUBLIC LIBRARY

treatment became no longer possible. In order to prevent variety from degenerating into a riotous miscellany, it became necessary to ignore the stories in the architectural composition, or at any rate to give over the idea of individualizing either each story, or a group composed of a few stories. After a good deal of experimentation, the solution of the new problem was found in a separate treatment of the bottom and the top, and a uniform treatment of the centre, without any fear of monotony, no matter of how many stories it might happen to consist. There were no precedents, I believe, in New York for the treatment of the problem when the Manhattan Life was erected. I do not recall whether the Home Life, which was an intelligent summation of what had been ascertained up to the time of its erection, in the design of very tall buildings, in spite of the irrelevancy of its picturesque crowning hood, was a little earlier or a little later in date. At any rate a New York designer who had not attended to what the architects of Chicago had been doing found himself thrown upon his own resources when the question was of fifteen stories or more. Now there would be no doubt in his mind. He would, as a matter of course, divide its height into a low basement and a low attic, neither of them of more than three stories, and a main wall between them, which should not be so subdivided as to compromise its singleness as a principal member of the building, no matter how high it was or of how many stories.

But it by no means follows, because this is now the accepted scheme of a sky-scraper, upon which different designers give scope to their individuality only in matters of detail, that the designers of the earliest sky-scrapers were to blame for not anticipating it. Simple as the scheme seems, it is the result of a good deal of experimentation crowded into the last decade. However that may be, it is plain that the comparative failure of the Manhattan Life building, as an architectural work, has come from the deviation from this general scheme, or rather from the failure to arrive at this general scheme. As a matter of fact the building lacks the unity in variety that comes from an assemblage of related and interdependent parts. The spectator is left in doubt which is the beginning and which the middle. As to the end there is no question. The building above the cornice culminating in the slender and graceful belvedere, is in itself a well-studied and effective composition, scarcely surpassed in its own kind by anything that has been done since. But below the main cornice the subdivision of the front is such as to reduce a confusion and uncertainty fatal to unity. If the architects were doing it over now, in the light of what has been done since, they would probably build above the massive two-story entrance a single story of openings equally spaced corresponding to the story under the cornice, and treat uniformly, as the shaft of the building, the ten stories included between

these two. But with the actual treatment, it is hard to say where the basement ends or what it comprehends. It may be of two stories, of five or of seven. The most emphatic horizontal member of the front is the heavily moulded cornice above the seventh story—much too emphatic to be overlooked in the general view. If we accept this as the main division, then the building above the two-story basement has two virtually equal middles, one of six stories and one of five. No art in the management of detail could bring into unity a front thus composed, or discomposed. If the architects had been less afraid of monotony and plainness in this shaft—for it is too ornate, as well as too diversified—the variety and the enrichment they have permitted themselves above and below would have been much more apprehensible and effective. For, as has been intimated, the massive base and the rich and harmonious capital leave in themselves very little to be desired. The detail throughout is as well studied and as well adjusted as we had reason from Mr. Kimball's previous works to expect that it would be. Especially exemplary is the difference in treatment between the stonework of the Broadway front and the more elaborate and fantastic treatment of the terra cotta of the New street front—one of our architect's happiest essays in that kind.

The Standard Building is very important by reason of its magnitude and capacity, but, architecturally, it is neither here nor there. Messrs. Kimball & Thompson's work has been to frame a pre-existing building, above and on one side, and also, I believe, to extend in a steel frame construction,a building which was originally of masonry and carried upon walls. The bracketing necessary to accomplish this extension in this way accounts for the huge projecting cornice which masks it, which bounds the new work, and which constitutes the chief, almost the only feature, of the front.

The Empire Building is, architecturally, upon a very different footing. The dimensions and the site opened a very unusual opportunity for a commercial building. The owners are not the first projectors of a sky-scraper to owe an obligation to the piety which has received from secular uses the churchyards of Trinity parish, for it is the churchyard of St. Paul's that has made feasible the building of that name, the value of which is immensely enhanced by the open space opposite. But Trinity churchyard itself secures a much ampler lighting and outlook to the huge pile of white granite that is rising to overlook it, and it ensures to the new structure also the certainty of being well seen. Upon the whole the new building, so far as it can be judged in its present incompleteness, is worthy of its conspicuousness. The unusual frontage upon Rector street "keeps it down" much more effectively than any architectural devices



EMPIRE BUILDING,
Broadway and Rector Street, New York City. Kimball & Thompson, Architects.

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Dobson Building—1895.
Philadelphia, Pa. Kimball & Thompson, Architects.

could do. Even with its twenty stories it has not the spindling look that the Manhattan could not help having, spindling rather than towering. And the design makes the most of the horizontal dimension. It shows a clear understanding of the special conditions of the problem in hand. The four-story basement, and the detached single story above it, give both a sufficient and an unmistakable substructure, and the two stories signalize by the order an appropriate capital. The single story with which at intervals of three stories the shaft is banded, is not emphatic enough to confuse the general division, and, indeed, has scarcely so much importance in the fact as in the drawing. The long arcade of the base-



1891-'92.

PHILADELPHIA & READING R. R. TERMINAL.

Philadelphia, Pa.

F. H. Kimball, Architect of Exterior of Office Building.
Wilson Bros., Architects and Engineers.



COL. FELLOWS' RESIDENCE.

Montclair, N. J.

Francis H. Kimball, Architect.

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The above is not the only unusual piece of work put through by this firm.

Another example is the handsome residence of Mr. August Zinsser, which stood for a number of years on the northwest corner of 58th street and Tenth avenue. When this house was built, it was the only house in the vicinity, and the owner expected the neighborhood would be built up with residences of a similar character. In this he was disappointed, as it, unfortunately, became a tenement-house district. Not wishing to sacrifice so valuable a building, he asked the above firm of builders what he could do about it, and they suggested his moving it to a more desirable location. He questioned the possibility of doing this; but they assured him they could do it; so he ordered them to go ahead. They took the house down, piece by piece, and rebuilt it exactly as it was before, both inside and out, on the corner of 68th street and Central Park West.

These are samples of what are attempted and done in the building business in New York to-day. Mr. Geo Vassar, Sr., is not only a very large builder but a successful one, so much so that he practically gave up active interest in the business some four or five years ago, during which time the business was conducted almost entirely by Mr. Geo. Vassar, Jr. He absolutely retired on the first of the present year. The firm is now continued under the firm name of Geo. Vassar's Son & Co. The members of the firm are Geo. Vassar, Jr., Jules J. Vatable, Harry P. Robbins.



The best proof of the manner in which the business is conducted is the list of very strong indorsements they possess from many of the best and most prominent architects of the country. They have a number of large contracts on hand at present, and are one of the busy firms of New York in the building business, and their prospects for continuing to be busy are extremely good—for as one of the firm remarked to the writer the other day they never have any difficulty in continuing to work for anyone from whom they have had one contract. The only difficulty they have is in working for them the first time, after that the task is an easy one.

BED-ROCK FOUNDATIONS.

IN no way better have Messrs. Kimball & Thompson shown themselves to be entitled to the appellation of "progressive architects" than in their search for improved methods of construction, and in their adoption of those which are distinctly meritorious. That their work, so well designed, and so well executed,



might be equally well-enduring, they have taken care that the foundations of the many tall structures which they have fathered, the very bases of their stability, have been made supremely adequate.

When Messrs. Kimball & Thompson were confronted with the problem of providing the necessary footings for the Manhattan Life Insurance Building, they encountered a condition practically without precedent in the building world. It was found that no system of foundations among all those which had ever been used for buildings would be sufficient or safe to sustain the enormous loads which

had to be cared for. Consequently, our architects promptly began to look for a system which would be adequate. The result of their investigation was the selection of the pneumatic caisson method of deep foundations. This method had long been used in founding the piers of bridges all over the world. When its feasibility as applied to the foundations of buildings, and its necessity in this particular case were explained to the architects by their engineer, they, with rare perspicacity and courage, decided on its adoption. Thus the construction of the foundations of the Manhattan Life Insurance Building became the precedent which has been followed by most of the architects of the very heavy buildings of lower New York.

The pneumatic caisson system is the third important step in the development of the modern tall building. It ranks scarcely second to either the elevator or steel skeleton construction, the other two important innovations, without which the sky-scraper would not exist. Prior to the introduction of the pneumatic caisson system the foundations were the weak spot of the high buildings. Conservative architects never had much faith in piling for structures of more than moderate altitude. As to grillage foundations, they were out of the question, so far as the sky-scraper is concerned, as it was not possible to get spread enough. The problem puzzled architects for many years, and numerous experimental solutions of the difficulty were attempted. None, however, were thoroughly scientific or satisfactory. The problem really was to carry the foundations of very heavy buildings down to bed-rock. That was accomplished for the first time by the pneumatic caisson system. The successful working out of this idea is one of the greatest achievements of this century. It eliminates all danger, even that arising from future operations in the neighborhood of a high building, the foundations of which are constructed on the pneumatic principle.

The complete success of the pneumatic caisson system, in the case of the Manhattan Life Building, of course, settled the question as to the proper way to treat similar problems.

Messrs. Kimball & Thompson used this method in the foundations of the new addition to the Standard Oil Company's Building, where it received an ingenious application. These architects also founded the massive Empire Building on caissons sunk by pneumatic pressure.

The engineers and contractors who have designed and executed these foundations for Messrs. Kimball & Thompson are Sooysmith & Company. This firm also designed and built similar foundations for the lastly built portion of the Johnson Building, for the American Surety Company Building, and for the Washington Life Building.

THE FUTURE OF GRANITE.

THE race is not to the swift" might, in the light of recent events, be amended to read, "The contract is not to the lowest bidder," for one of the most important municipal contracts ever bid for in New York has been awarded to the highest bidder, Mr. John Peirce. Not only is this award a compliment to Mr. Peirce's ability and integrity as a builder but is an evidence of the important part stone plays in modern buildings, for the award was based upon the mention in the bid of the use of Hallowell granite. This granite is widely known at the present time on account of its hardness and durability, but its successful introduction throughout the United States is due to Mr. Peirce's personal efforts. As the largest stockholder in the Hallowell Granite Co., he has made the market for this stone what it is to-day. Mr. Peirce comes naturally by his knowledge of building stone, as his father was one of the proprietors of the Mount Waldo quarries. He is interested, also, in the Bodwell Granite Co., of Rockland, Me.; the Mt. Waldo Granite Co., of Frankfort, Me., and the Stony Creek Red Granite Co., of Stony Creek, Conn. He is President of the New York and Maine Granite Paving Block Co., of 5 Beekman street, New York City. The growth of granite as a building material has been remarkable. It has, it is true, had its ups and downs, like any other building stone, but it is gradually returning to general use, not only for public buildings, but also for private residences, where its appearance, after being exposed to the weather for several years, is a strong consideration with the owners. It is generally conceded that Mr. Peirce has played a large part in this restoration and increase in favor of granite. Its increased use at the present time is not ephemeral, but is a steady and unyielding growth.

In the first place, architects are beginning to recognize its monumental character. For the tall building particularly, an artistically heavy material is necessary because of small piers and slim wall-spans, inevitable in structures where light is of prime importance. With the use of skeleton construction, the piers of buildings have been reduced more than ever until they are now scarcely more than narrow pilasters. When these are built of brick, even in combination with terra-cotta, the general effect usually has a certain thin and cheap look about it, particularly if the building is one of great altitude. An appreciation of this defect has restored stone generally to favor again, so that it now occupies the old-time pre-eminence

whence it was ousted some years ago by the great popularity which clay products acquired. Granite particularly has been restored to favor where solidity and mass are required. Unquestionably it is artistically superior to any other stone for the architectural substructures of tall buildings, and it has been used both rough and dressed in many of the most successful designs built in the last few years, as may be seen by the list given below. Let anyone compare, for instance, the Union Trust Co.'s Building, the Times Building, the new Empire Building, or the American Surety Building, all built entirely of granite, with other buildings of, perhaps, as artistic design, but carried out in brick. It will be seen at a glance how much is gained architecturally by the use of the heavier and more monumental material.

The list of buildings subjoined may be used, not only to illustrate this point, but to show how the leading architects of the country have recognized the necessity for the use of granite for the complete realization of their designs. Mr. Peirce has heartily co-operated with the profession to supply them with granite answering all their requirements, structural and artistic.

Mr. Peirce has built or furnished the stone for the most expensive buildings in this country. The United States Postoffice in Chicago, Henry Ives Cobb, architect, now building, at a cost of two million dollars; the Washington Postoffice, W. J. Edbrooke, architect, at a million and a half, and the Buffalo Postoffice, W. Martin Aiken, architect, at one million. Among the prominent buildings erected by him are the Madison Square Garden, Sherry Building, and Columbia University Buildings, of McKim, Mead & White; the Union Trust Co., the Times Building and the Erie County Savings Bank, of the Architect George B. Post; the Empire Building, of Kimball & Thompson; the Mutual Life Building, the Bank of America, and the Mechanics' National Bank, of C. W. Clinton. Other buildings include the American Surety Building, Bruce Price, architect; the Bank of Commerce, and the Johnston Building, of Jas. B. Baker; the Hotel Martinique, Henry J. Hardenbergh, architect; the Cushman Building, C. H. P. Gilbert; Cathedral of St. John the Divine, Heins & LaFarge; Carnegie Library. Allegheny, Pa., Smith Meyer & Pelz; Methodist Book Concern, Edward H. Kendall; and the Macy Building, Schickel & Ditmars. Mr. Peirce's work as a general contractor and builder has been confined chiefly to the municipal and government buildings in the above list. These are among the handsomest and costliest in the country. In all the other buildings this stone has been used entirely or partially. The contract for the Hall of Records is a most important work, and its completion will establish Mr. Peirce as a builder in the front rank of not only New York but American contractors.

ARCHITECTURAL IRON AND BRONZE WORK IN AMERICA.

IT is a well-established fact that all nations which have been made the subjects of geological or antiquarian research have been users and founders of bronze, and later of iron for various purposes. Among the most prized relics of prehistoric days found in museums and in the private collections of antiquarians are found bronze articles, mainly consisting of weapons of defense and offense and other specimens of bronze articles of adornment and religious ceremony. Scientists tell us that primitive man was a skilled bronze worker many centuries before the Iron Age arrived; that the Bronze Age, it is agreed, lasted until 200 years before the Christian era, when the Iron Age, which continues to run its course, began. Since that time architectural and artistic bronze and iron work in countries both European and Asiatic has been no mean criterion of the advances in civilization made by that country. Thus we find the armorers of France at the time of the Crusades hammering out artistic devices which excelled in design and workmanship those of any European country. Japan in the East attained a high degree of proficiency in artistic iron and bronze work several centuries ago, far outstripping any of her Eastern compeers in technical skill, modeling and designing.

In America the growth of in the development of architectural and artistic iron and bronze founding may be said to have begun about thirty years ago. Before that date but little of the now old-fashioned hammered wrought iron work was done in America. Italian and French wrought iron designs were greatly copied in the work done, and but few of the skilled workmen were native-born Americans. The wealthier class of people imported most of the ornamental iron and bronze work from Europe, for the class of work done was greatly inferior to the transatlantic work in handicraft and design.

The first step in the growth of architectural iron work in America was not considered extremely radical at the time. It consisted in the use of a series of iron columns in imitation of stone work. Gradually the treatment became more ornamental and grill work was introduced. Another opportunity came with the circling stairs, and finally with the advent of the elevator. The enclosures for the elevator shaft were originally constructed of wood and afterwards sheet iron when the demand for more safety against fire was made, for it was found the elevator shafts proved like flues to a fire carrying the flame and consequent destruction throughout the whole building. The building laws were so framed soon after the advent of the elevator that they regulated the enclosures of the shaft to metal casings. One of the late examples of architectural iron work completed in this city is that of the stair and elevator work in the Empire Building, Rector street and Broadway.

The stairs and elevator enclosures in modern office buildings now form one of the main features of the building, and a great deal of attention is given by the architect to design this work so as to harmonize with the surroundings, which are frequently of richly colored marbles, and highly decorative plaster work. In designing the elevator enclosure for the Empire building, the architects, Kimball & Thompson, were careful, owing to the large space to be enclosed, to so design the work as not to appear too massive; consequently a new feature was introduced in making the columns a combination of cast and wrought iron, which enabled the manufacturers, Messrs. Richey, Browne & Donald, to produce a much lighter effect than would have been the result had the design required that these columns should have been made of cast iron alone. One of the special features of the elevator enclosures is the ease with which the doors are moved, owing to a special device just discovered, and for the first time used in this building, in the way of an anti-friction trolley, which is a great improvement over similar devices now in use, owing to its simplicity and durability, and creating less noise than any other. In order to produce the best results in constructing the stairs, and this applies to the elevator enclosures also, the construction was so arranged as to avoid the use of any visible screws or bolts, which is a very great advance over any work, previously produced, in its final appearance. The elevator cars in this building are well worthy of the attention of those who are interested in architectural design, as they depart very largely from the ideas which have prevailed in reference to the design and construction of iron elevator cars. In this connection it may be remarked that Mr. R. B. Browne, of Richey, Browne & Donald, made working drawings for the first modern iron elevator car used in America or Europe. This enterprising firm has also succeeded in developing an imitation of bronze for finishing purposes. The finish of the stair work in the Empire building so closely resembles real bronze that to the uneducated eye it appears to be the solid metal.

Messrs. Richey, Browne & Donald, as an architectural iron working firm, has contributed in no slight measure to the development in recent years of artistic iron work in America. The members have proven themselves to be most enterprising in securing the best facilities for carrying out the most elaborate designs and in completing the largest contracts for architectural iron and bronze work in America. Among the many important contracts performed by this firm may be mentioned the Astoria Hotel, Henry J. Hardenbergh, architect; Empire Building, Kimball & Thompson, architects; Manhattan Life Building, Kimball & Thompson, architects; United Charities Building, R. H. Robertson and Rowe & Baker, architects; New York Life Building, McKim, Mead & White, architects; Mrs. E. F. Shepherd's residence, McKim, Mead & White, architects.

ART WORK IN HARDWARE.

A WALK up Broadway, from the Battery, at the present time will show the results of the great activity which has prevailed during the last half-dozen years, and is still prevailing, in the construction of large office and mercantile structures in or contiguous to that thoroughfare.

The entire appearance of the main artery of the city has been changed, and the "skyline," which is one of the most marked traits of the physiognomy of any city, has been so altered as to be scarcely recognizable by one who knew what it was a few years ago, but has not witnessed the reconstruction that has been carried on so energetically in the last few years. It is not necessary to go very much further back than 1890. There were, indeed, tall buildings prior to that date, but they were rarely of more than ten stories, that being practically the limit set by constructional difficulties. The true sky-scraper was ushered in by the system of steel skeleton construction.

While it is true that the introduction of the skeleton frame made these mammoth structures possible, it is also equally true that the skill and energy of a comparatively small circle of men has made them a practical success. The buildings on Broadway, below City Hall Park, which are about completed, include the Empire Building, Kimball & Thompson, architects; the Washington Life Insurance Company, Cyrus L. W. Eidlitz, architect; the Singer Building, Ernest Flagg, architect; the Park Row Building, R. H. Robertson, architect, and the Franklin Building, Clinton & Russell, architects, which is just off Broadway, on Murray street. An enumeration of the architects of the greater part of the large office buildings down-town would result to a great degree in a repetition of the names of the above architects.

If this is true of architects, it is still more true of the contractors. For instance, in the five representative buildings mentioned above, where we find five separate architects, the hardware for all was furnished by one firm, P. &. F. Corbin, of Nos. 11, 13 and 15 Murray street, in the new Franklin Building.

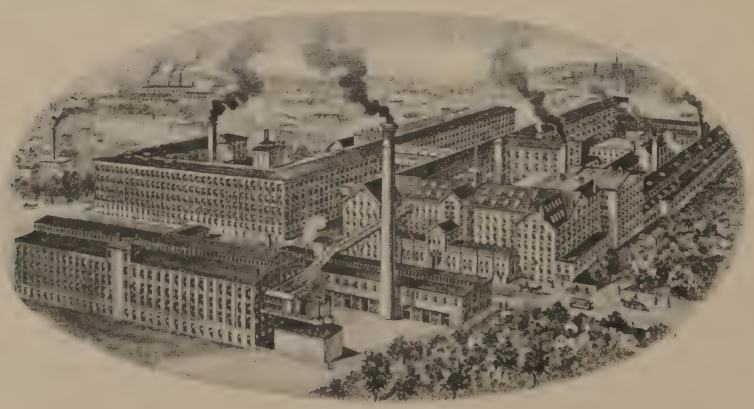
In addition to the above, this firm has also done the Park Building, Pittsburg, Pa., George B. Post, architect; the Dakota Apartment House, Henry J. Hardenbergh, architect; the Edison Building, Carrère & Hastings, architects; the Shoe and Leather Bank Building, Cady, Berg & See, architects; the Lakewood Hotel, Schickel & Ditmars, architects; Columbia University, McKim, Mead & White, architects; and for Messrs. Kimball & Thompson, the Standard Oil Building and the Garrick Theatre.

Artistic working in metal has been a development of the last twenty years. Previous to that time the metal work in buildings

was merely a necessary evil, generally totally out of keeping with the character of the architecture and seldom possessing any artistic merit. It was in very few cases that the general scheme of the architect was carried out in this smaller work. The aberrations of this kind which we see in the old buildings at the present day are familiar to us, and the contrasts are often so glaring as to forcibly attract our attention. The change within a few years, however, has been marked. The metal work in the modern building has become a subject for serious consideration and often of large expense. For instance, the locks and lock plates in a large building recently erected uptown cost a small fortune in themselves. The elimination of everything not absolutely essential in the new office buildings has made artistic hardware a large factor in making these structures attractive to the eye.

Improvement, of course, has not been confined to the artistic side of hardware. Great attention has been given to the mechanical qualities. Architects have learnt that there is no economy in equipping a building with cheap hardware, for it is this part of a building that receives by far the greatest amount of service. It is constantly being operated and handled, and, therefore, should be of the most substantial character in point of mechanical construction and weight. This is particularly true of the fixtures needed in the large modern office building, the perpetual traffic through which gives the hardest possible usage to door fixtures. Experience has demonstrated to architects that nothing but the best is really cheap.

The firm of P. & F. Corbin is one of the largest hardware manufacturers in New York, if not in the United States. Their works include many of the largest and finest of the modern structures which are making New York architects and builders famous. How large a part they have played in the development of artistic hardware is readily seen from the fact that in each of these buildings the hardware is made from special designs, and that they are the representative buildings of the last few years.



SOME FACTS ABOUT PORTLAND CEMENT.

IT is gratifying to know that we are at last producing cement in this country which is equally as good, if not better, than that made abroad. Twenty-five years ago the only first-class cement which we were able to get came from England. A few years later, however, the Germans began its manufacture on an extensive scale, and commenced gradually to supersede their English neighbors. This result was obtained by paying careful attention to the minute details of manufacture, and by applying scientific methods to the production of what seemed to be a somewhat crude and common article.

The first Portland cement which was imported into this country was far too expensive to render it practicable for general use. But its superiority over the domestic quality was quickly recognized, and it began to be imported on a scale which speedily brought a reduction in price. The Germans were beginning to show the world the fallacy of the belief that Portland cement could be made only in England. It now only remained for American enterprise to enter the field and compete with the foreign manufacturers.

Among the first companies to begin the manufacture of Portland cement in this country on a large scale was the Atlas Cement Co. It was established in 1889. It built large mills at Copley, Pa., and Northampton, Pa., and was soon one of the largest producers in the United States. It has a present capacity of four thousand barrels a day, which will shortly be increased to ten thousand. For Kimball & Thompson this company has done much work. Two of the latest for which they are supplying the cement are the Empire Building and the Standard Oil Building. The following list includes the major part of the important buildings built in New York during the past few years, as well as some in course of completion. The frequency with which the names of the architects of world-wide reputation is repeated here is the highest credential which could be given:

Besides the buildings of Kimball & Thompson, the cement of the Atlas Cement Co. has been used in the St. Paul Building, Havemeyer stores, Equitable Building, Weld Estate Building and Coe Estate Building, for all of which George B. Post was the architect; the Sherry Building, the New York Life Insurance Building, and the University Club, of McKim, Mead & White; the Exchange Court Building, Clinton & Russell, architects; the Singer Building, Mills Hotels, Nos. 1 and 2, and Scribner Building, of Ernest Flagg; the American Surety Building, Bruce Price, architect, and the Hart-

ford Fire Insurance Building, Cady, Berg & See, architects. Other important buildings are the Townsend Building, the Fidelity and Casualty Building, and Washington Life Building, Cyrus L. W. Eidlitz, architect; the Gillender Building, of Berg & Clark, and the Johnston Building, the Presbyterian Building, and Bank of Commerce, J. B. Baker, architect.

The tensile strength of Atlas Cement, established by impartial tests, has been found to be greater than any other cement, domestic or imported. Its use is not confined to buildings. It is employed by engineers, because of its excellent qualities, in lighthouse work and in the construction of docks and bulkheads, and many of the great railroads of the country specify it for their heavy masonry in preference to any of the imported cements.

The users of Atlas Cement include all the great architects and engineers of the United States.



THE WORKS OF THE ATLAS CEMENT COMPANY.
Northampton, Pa. Daily Output, 4,000 Barrels.



EMPIRE BUILDING,
Broadway and Rector Street. Kimball & Thompson, Architects.

P. & F. CORBIN,

Art Workers in Metal,

AND MANUFACTURERS OF BUILDERS' HARDWARE.

Offices, 11, 13 & 15 Murray Street, New York.
Works, New Britain, Conn.

The following are among the many prominent and important buildings supplied with hardware by this firm :

EMPIRE BUILDING,	KIMBALL & THOMPSON, Architects
STANDARD OIL BUILDING,	KIMBALL & THOMPSON, Architects
MONTAUK CLUB,	KIMBALL & THOMPSON, Architects
PARK BUILDING,	GEORGE B. POST, Architect
SINGER BUILDING,	ERNEST FLAGG, Architect
PARK ROW BUILDING,	R. H. ROBERTSON, Architect
WASHINGTON LIFE INSURANCE BUILDING,	CYRUS L. W. EIDLITZ, Architect
DAKOTA APARTMENT,	HENRY J. HARDENBERGH, Architect
EDISON BUILDING,	CARRERE & HASTINGS, Architects
SHOE AND LEATHER BANK BUILDING,	CADY, BERG & SEE, Architects
LAKEWOOD HOTEL,	SCHICKEL & DITMARS, Architects
FRANKLIN BUILDING,	CLINTON & RUSSELL, Architects
VANDERBILT BUILDING,	MCKIM, MEAD & WHITE, Architects

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Yours respectfully,

R. H. HUNT.

GEO. B. POST, Architect,
33 East 17th Street,
New York.

18th Feb., 1898.

Dear Sir:—You are misinformed with regard to the statement made by me to the Board of Examiners of the Department of Buildings. My statement was that the gas pipes in Mr. C. Vanderbilt's house, "The Breakers," had corroded seriously and it seemed that the corrosion, as far as the evidence at that time in my possession went, occurred where the pipes were enclosed in King's Windsor cement. At the same time I stated that I was by no means sure that the King's Windsor cement had anything to do with the corrosion.

Recent examinations which have been carried further, show that the corrosion had occurred at other places besides those in which the pipes were encased in King's Windsor cement, and before the receipt of your letter I had informed the Board of Examiners of this additional information. I am,

Yours very truly,

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TROOP "A" ARMORY, Madison Ave.... Mr. John R. Thomas, Arhitect.
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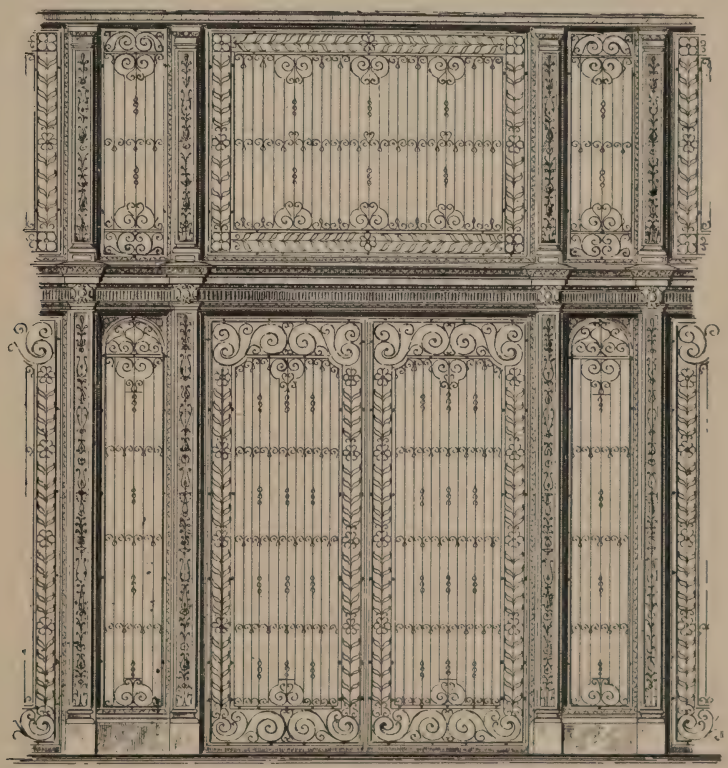
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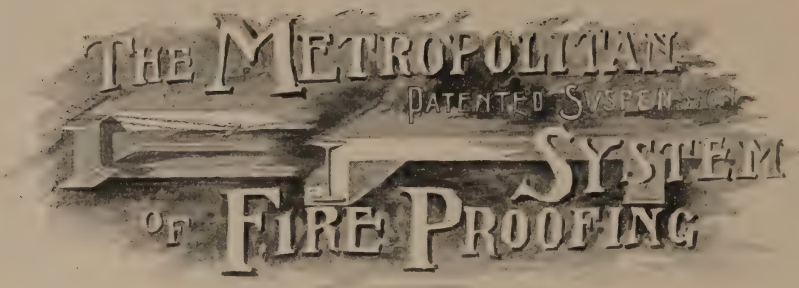
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Buildings.	Locations.
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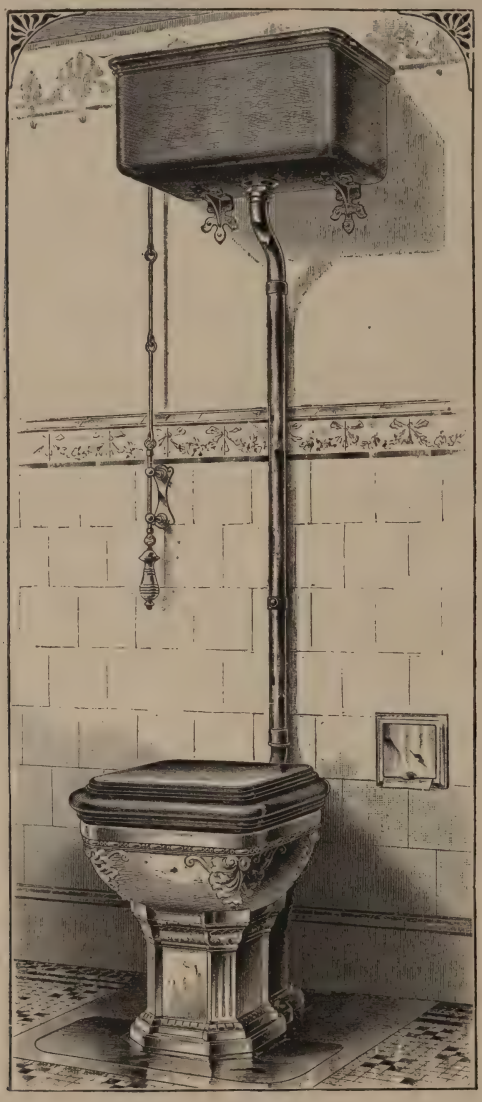


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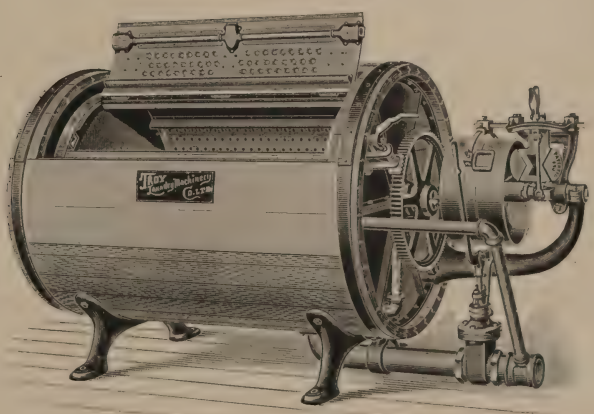
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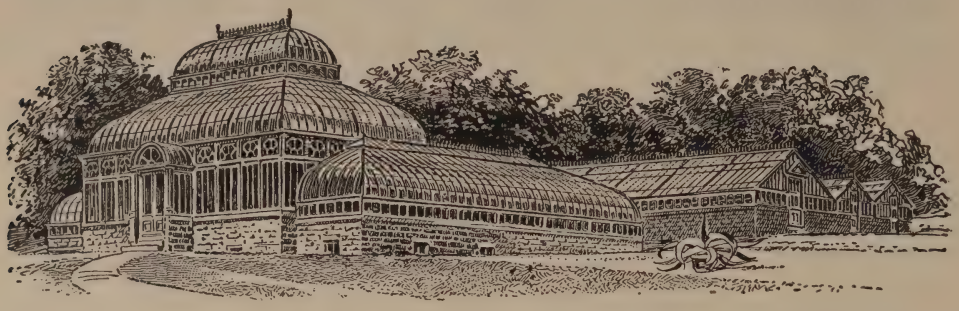
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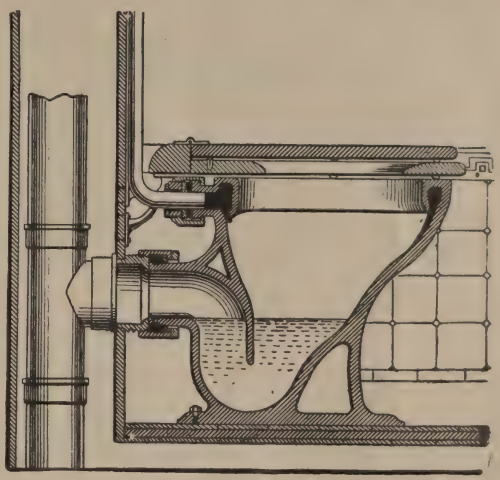
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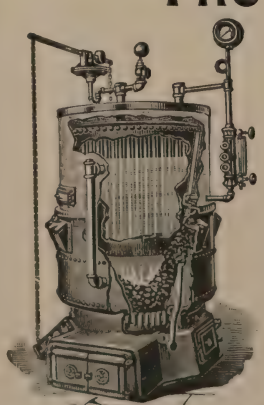
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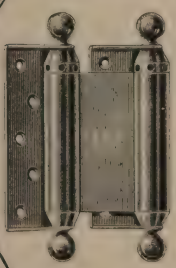
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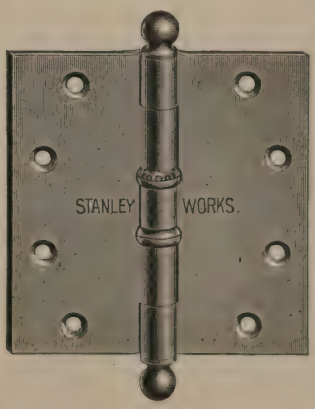
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